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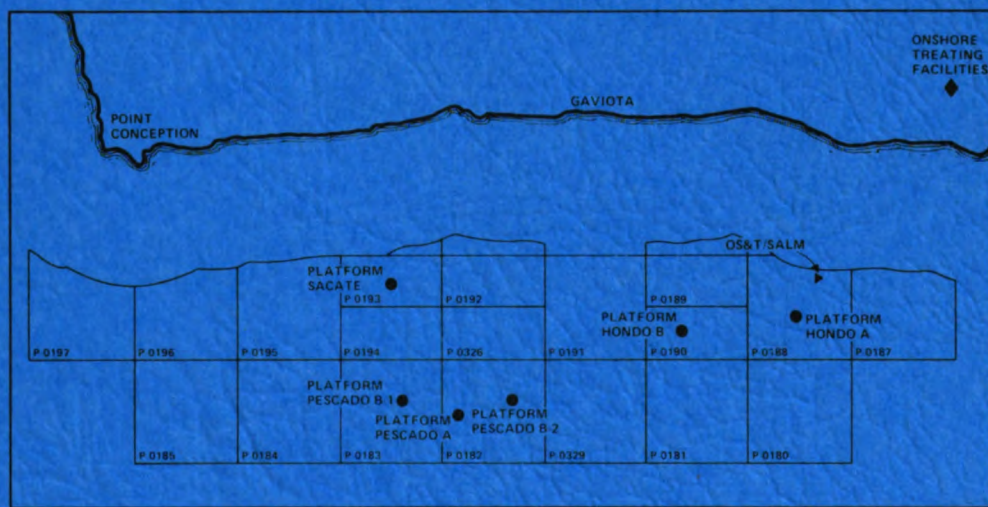
REVISED DRAFT Environmental Impact Statement/Report

Technical Appendix 6 CULTURAL RESOURCES

for

Santa Ynez Unit/Las Flores Canyon Development and Production Plan

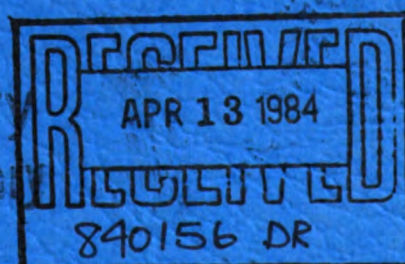
Proposed by
EXXON COMPANY, U.S.A.



Prepared for
UNITED STATES MINERALS MANAGEMENT SERVICE
CALIFORNIA STATE LANDS COMMISSION
COUNTY OF SANTA BARBARA

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6. CULTURAL RESOURCES

6.1 INTRODUCTION

This Technical Appendix supports the summary analysis presented in the EIS/R. Section 6.2 describes the legal basis for the consideration and protection of cultural resources in the EIS/R planning process. Section 6.3 describes the affected environment and includes an overview description of the project region and detailed descriptions of the project sites. Section 6.4 describes the environmental and likely cumulative effects of this and future projects proposed for the South Coast area. Section 6.5 presents possible mitigation measures. References are listed in Section 6.6.

The approach taken in this report has been to a) compile a baseline description from existing sources; b) evaluate the quality and extent of the database in terms of professional standards and criteria established by the California State Historic Preservation Office, and the County of Santa Barbara; and c) assess impacts and propose mitigations on the basis of the evaluated baseline.

6.1.1 Scope

As a class of resources considered in planning for the assessment of impacts resulting from federally assisted or permitted developments, cultural resources are defined to include: 1) prehistoric and historic archaeological sites and artifacts of aboriginal origin; 2) ethnographic sites and areas of concern identified in historic literature or by contemporary Native American descendants; 3) European-American structures of historic or architectural significance; and 4) properties, districts, or archaeological sites with historic significance. Although less broadly conceived, California Environmental Quality Act (CEQA) requires consideration of most of these types of cultural resources.

Usually, the term cultural resources is defined with an emphasis on the material remains of prior cultures. These remains include prehistoric and historic

districts, sites, structures, and other evidence of human use considered to be of importance to a culture, a subculture, or a community for scientific, traditional, religious, and other reasons. These resources may be prehistoric aboriginal sites, historic Native American and Euroamerican areas of occupation and activity, or features of the natural environment.

The federal government has long affirmed through federal law the principle that preservation of such resources is an important element in maintaining cultural diversity and preserving American heritage values on the local, state, and national levels. As a result, laws have been passed that create a National Register of Historic Places and institute procedures to protect cultural resources that are potentially eligible for the National Register of Historic Places, and these resources are the principal focus of the following report. Other laws protect another, less tangible kind of cultural resources which are also considered in this report.

Cultural resources include all those resources and circumstances necessary for the maintenance of an integrated, unique culture. Many cultural resources are non-material in nature. These less tangible cultural resources include social organization and kinship, religion and world views, cognitive systems (including the meanings and values attached to items of material culture), traditional or customary behavior patterns, and folklore. Additionally, the set of interrelationships and interdependencies between these various cultural items, the fabric that gives culture a systemic quality, is perhaps the most important and most intangible of cultural resources. Because the proposed project involves potential development of areas considered to be sacred to local Native Americans, the less tangible aspects of cultural resources are of substantial importance to proper impact evaluation. The National Environmental Policy Act (NEPA) mandates that attention be given to cultural resources in this broader sense. In addition, the meaning and significance of a cultural property is based largely on the less tangible components of a culture. Information regarding the significance of an historic property to a particular culture group is considered when evaluating whether a property is

eligible for the National Register and hence subject to cultural resources compliance procedures which are discussed in Section 6.2.

6.1.2 Definitions

6.1.2.1 Culture

A culture can be defined as the particular system of values, ideas, rules, norms, behavior patterns, world view, cognition, social organization, kinship, religion, customs, beliefs, traditions, technology, and economy that organizes a particular human group in adapting to its environment. In the modern world, often different cultures are included in a single national state.

Culturally distinct groups maintain themselves by utilizing a wide range of material items. These materials have literal and symbolic meanings. the integrity and uniqueness of any culture is maintained through the daily interaction of these material and non-material components. As with other systems, the diverse components of cultural systems operate in relation to one another. Modifications of one aspect of the system can result in wide ranging effects in the organization and persistence of a culture.

Differences between cultures result from the actions of human beings within a particular group and by the actions of other human groups defined and motivated by different cultural systems.

6.1.2.2 Prehistoric and Historic Archaeological Sites

Most of the cultural resources within the western Santa Barbara Channel region are archaeological sites which are associated with either Native American or European-American occupation of the area. Archaeological sites are places where past human activity has measurably altered the earth.

The majority of the archaeological sites in the western Channel were formed before European colonization and are the primary source of information about the development of Native American societies. The most frequently observable artifacts on the surface of archaeological sites include refuse from stone toolmaking and sharpening, stone tools or stone tool fragments, heat-altered rocks, ash, bone, and shell fragments. These remains resulted largely from the preparation of food. Below the surface of most prehistoric archaeological sites are the remains of hearths and ovens, as well as soil disconformities associated with residential and sacred structures, ovens, storage facilities, and burials.

Because most archaeological sites are built up over time, it is usually possible to distinguish different periods of occupation at the same time. Archaeological sites formed during and after the Spanish colonization of California usually can be easily distinguished from those formed before colonization. Historic archaeological sites frequently contain iron artifacts, pottery, porcelain, glass, coal, and other materials not used in the area before Spanish contact.

Many of the Native American archaeological sites within or near canyon mouths were occupied by relatively large populations for long periods of time. For this reason, these sites are internally complex and contain the remains of structures and cemeteries occupied during different time periods.

6.1.2.3 Native American Ethnographic Sites and Areas of Concerns

Ethnographic sites in the South Coast region are prehistoric and/or historic cultural resources which have been identified in consultation with Native Americans of the area. Many have aboriginal placenames and may include: prominent topographic features, residential and cemetery sites, mineral deposits, plant gathering places, and sacred places. The majority of the ethnographic sites in the Santa Barbara Channel region were recorded by J. P. Harrington over 50 years ago. In the intervening period, the significance of these sites

to contemporary Native Americans may have changed. In addition, a number of more recently evolved ethnographic sites and areas of concern have come into existence in the last two decades as a result of the cultural growth and unique persistence of local Chumash descendants.

Most local Native American descendants are actively involved to some extent with the preservation of cultural resources and Native American heritage. These are several major areas of heritage concern to contemporary Native Americans: 1) native flora and fauna including local natural raw materials; 2) sacred areas; and 3) archaeological sites, especially those containing human remains.

Both federal and state legislation require consultation with Native American descendants prior to defining project-specific mitigation measures at archaeological sites.

There are two types of Chumash groups at present: land-based associations, and community-based associations. For the last 10 to 15 years, the Chumash population has been consolidating into numerous small groups, some of which are developing or attempting to expand land bases. Some of the groups are maintaining what are perceived as traditional Chumash approaches to religion, subsistence practices and residence. These groups have two major characteristics: 1) they participate in the renewal and perpetuation of Chumash heritage; and 2) they are active in the preservation and enhancement of Native American values and traditions. The groups do differ from one another in focus and concerns, in community and political organization, and in the extent of their participation in traditional activities.

6.1.2.4 Historic Resources

Historic cultural resources encompass a wide variety of resources including European-American archaeological sites, places, or districts of local historical significance, and architectural properties. European-American

archaeological sites contain material remains associated with European societies that began the exploration and colonization of North America in the 16th century. In California, the historic European-American period of occupation dates from the Spanish exploration (1769) to the beginning of the 20th century. Places or districts of local historic significance are usually associated with archaeological remains. Architectural properties with historic significance include single standing structures and districts that have historic, aesthetic, or thematic associations with local tradition.

6.1.2.5 Marine Cultural Resources

A wide variety of cultural resources have been found underwater off the shores of California. These include prehistoric artifacts, submerged archaeological sites and historic buildings, downed aircraft, and shipwrecks (Stickel et al., 1978). Artifacts, the most numerous resources located to date, have been deposited beneath the sea by several factors, including cliff erosion of archaeological sites, ceremonial discard, and accidental loss as a result of overturned aboriginal canoes (tomols). Prehistoric sites have been found on ancient landforms now buried beneath California waters off Malibu and La Jolla. Similar sites could potentially occur in the project area down to a depth of 492 feet. However, the geological conditions necessary for site preservation are largely absent in the project region and there is, at best, only a low probability of their being found. Shipwrecks, in contrast, are relatively numerous because of the area's long history of seafaring activity and the hazardous sailing conditions around the South Coast California (State Lands Commission, 1982).

6.2 LEGAL REQUIREMENTS

6.2.1 Overview

The legal framework which mandates the consideration of cultural and archaeological resources in project planning is complex and wide-ranging. Federal,

state, and local governments have developed laws and regulations designed to protect cultural resources under their jurisdiction or that may be affected by actions they undertake. These laws and regulations can be categorized as follows:

- Historic preservation legislation. This legislation includes a variety of federal laws and regulations that mandate a system of permits for conducting archaeological studies and salvage on federal land, as well as guidelines to preserve historic sites for the public. Recent legislation includes the National Historic Preservation Act of 1966 and the Archaeological and Historical Preservation Act of 1974.
- National Environmental Policy Act of 1969 (NEPA). This legislation is broad in scope and states that it is a national policy to "preserve important historic, cultural, and natural aspects of our national heritage."
- American Indian Religious Freedom Act of 1978. This act was created to ensure the right of religious freedom, including ceremonial or religious events or practices, access to sites of religious value, and possession of objects of sacred or ceremonial value. This act indirectly influences decisionmaking and consultation regarding archaeological resources.
- State and local laws and regulations. A wide variety of state and local legislation contains sections designed to protect cultural resources. This legislation includes the California Environmental Quality Act, the California Coastal Commission archaeological guidelines, the California Health and Safety Code, and the California Public Resources Code. Recent changes and amendments in the Public Resources Code regarding archaeological mitigation (Sec. 21083.2) and Native American human remains in archaeological sites (Secs. 5087.88, 5097.99, and 7050.5) have complicated archaeological mitigation procedures. Because federal procedures will be required for a data recovery program (should this measure be needed to mitigate impacts) the CEQA restrictions on archaeological salvage would probably be superseded because of the precedence of federal law.

Each of these legal requirements is reviewed in greater detail in the following sections.

6.2.2 Historic Preservation Legislation

The development of a system of historic preservation laws and regulations spans the last 75 years. Especially over the past 15 years, these statutes have been developed into a well-defined set of procedures for the protection of significant historic properties.

The Antiquities Act of 1906 was the first piece of historic preservation legislation. It expressed concern over the destruction of important historic and archaeological properties by nonprofessionals, and it established a system of permits for conducting archaeological studies on federal lands. Penalties were specified for noncompliance. Some antiquities permits issued under this law are still in effect, though new permits are now being issued under the Archaeological Resources Protection Act of 1979 and its draft implementing regulations.

A great deal of archaeological survey and excavation was conducted during the 1930s under the public works programs designed to pull the United States out of the Great Depression. Much of this work involved excavations at sites that were to be flooded by reservoirs. After World War II, dam construction proceeded all across the country, and numerous archaeological excavations were conducted in conjunction with this construction. This led to the passage of the Reservoir Salvage Act of 1960, which authorized expenditure of federal funds on archaeological salvage at federally funded reservoir projects. In 1974 the Archaeological and Historical Preservation Act (AHPA) amended the Reservoir Salvage Act. This act deals with the preservation of data, not the preservation of historic properties as physical entities. It authorizes expenditure of up to 1 percent of the construction cost of a federal action for the purpose of mitigation through data recovery. Recent amendments to the California Environmental Quality Act which limit mitigation expenditure to less than 1 percent are superseded by the AHPA directive because the proposed project is a federally permitted action.

Another set of laws and regulations was conceived from a broader notion of historic preservation. The Historic Sites Act of 1935 declared that it is national policy to "preserve for public use historic sites, buildings, and objects of national significance." The National Historic Preservation Act (NHPA) of 1966 has provided a broader base for the implementation of this preservation goal. The act established a National Register of Historic Places and the Advisory Council on Historic Preservation (Advisory Council or Council). Section 106 of this act requires that federal agencies consult with the Advisory Council prior to engaging any undertaking that would affect a property on or eligible for the National Register. Eligibility is determined through consultation with local Native Americans, archaeologists, and other experts as well as with the State Historic Preservation Officer (SHPO). The procedures for eligibility determination, as well as for determination of possible adverse effect (36 CFR 800) include the submission of an identification of possible eligible sites to the SHPO in a preliminary case report. The ultimate determination of no effect, no adverse effect, or adverse effect will be made through on-going consultation with local experts and the SHPO. The Advisory Council has developed regulations for the implementation of Section 106. These regulations encourage coordination of agency cultural resource compliance requirements under Executive Order 11592 and the National Environmental Policy Act with those for Section 106. The Advisory Council guidelines (36 CFR 800) provide a specific set of procedures to be followed by an agency for compliance with the National Historic Preservation Act. These regulations encourage coordination of agency cultural resource compliance requirements under Executive Order 11593 and the National Environmental Policy Act with those for Section 106.

A central concern of Council guidelines is with evaluating the significance or value of cultural resources. Necessary to comply with federal legal directives (e.g. NHPA, as amended; E.O. 11593; NEPA), significance evaluation is central to decisions regarding resource management. If a property is not significant, it need not be preserved, enhanced, or salvaged (King, Hickman,

and Berg 1977). Significant resources are those that are now on or are eligible for listing on the National Register of Historic Places. With regard to resource significance, the Advisory Council guidelines state the following:

"the quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period, or method or construction, or that represent the work of a master, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 800; emphasis added)."

These criteria have been utilized in assessing the significance of cultural resources that may be affected by the proposed project and its proposed alternative. In those cases where information was insufficient to reasonably assess site significance, each resource was classified as potentially significant, a worst-case procedure that complies with Section 110 (a)(2) of the National Historic Preservation Act.

The procedures and set guidelines set forth in 36 CFR 800 bind all Federal agencies, including the council. Any deviation leaves agencies, including the council, vulnerable to litigation (Office of Historic Preservation 1979).

6.2.3 The National Environmental Policy Act

The stated purposes of the National Environmental Policy Act (NEPA) are:

...to declare a national policy which will encourage production and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish the Council on Environmental Quality.

This law established the requirement that any major federal actions significantly affecting the quality of the human environment be preceded by a detailed analysis and report on those effects. Such a report is called an environmental impact statement (EIS). NEPA states explicitly that it is a national policy to "preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice." While NEPA includes the concerns of the historic preservation legislation already discussed, it is also broader in its scope. It calls for a "systematic, interdisciplinary approach" that makes use of the "natural and social sciences." Thus through the implementing guidelines of the Council of Environmental Quality (CEQ), Social Impact Assessments have come to be a required element of an EIS. A Social Impact Assessment would include consideration of what has been referred to here as intangible cultural resources as well as social, demographic, and economic issues. The discussion of Native American concerns and the evaluation of site significance in terms of those concerns (Section 6.3.1.5) meet the general objectives of a Social Impact Assessment focused on Native American persistence and project effects on sacred places. Santa Barbara County's "Requirements and Procedures for Assessing Ethnic Cultural Resources and Concerns" and guidelines for protecting and preserving Native American cultural resources set forth by the United Chumash Council of Santa Barbara County were utilized in the Social Impact Assessment.

6.2.4 American Indian Religious Freedom Act and Related Legislation

The American Indian Religious Freedom Act (P.L. 95-341) of 1978 calls for the protection and preservation of the rights of Native Americans to exercise

their traditional religions. These rights include but are not limited to "access to sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites." The law further enjoins the President to direct federal agencies to protect and preserve Native American cultural rights and practices.

This law is taken into consideration in the evaluation of the significance of sacred sites in the project area, in the determination of impacts to those sites, and in the recommended mitigation procedures which include consultation with the California Native American Heritage Commission.

Specific mandates for consultation regarding archaeological remains protected under this legislation are attributable to:

- The State Office of Historic Preservation which must review and approve data recovery mitigation programs;
- Recent revisions to the Public Resource Codes (Secs. 7050.5, 4097, 98, and 5097.99) which protect human remains in archaeological sites/
- Local planning guidelines including County guidelines for data recovery mitigation; and
- Federal law and guidelines outlined in a subsequent section, Federal Cultural Resource Compliance Procedures.

6.2.5 State Laws, Agencies, and Guidelines

There are many well-organized and relatively powerful Indian groups and reservations in California. Through the efforts of these groups, a number of protections afforded by federal law have recently been instituted in state law. In addition, cultural resource protection was included in the scope of general environmental legislation of the last decade such as the California Environmental Quality Act and the Coastal Zone Conservation Act.

6.2.5.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) of 1970 sets forth the state's policies for environmental protection. This act provides for the identification of resources through the preparation of environmental impact reports. It further provides that the loss of resources be avoided or mitigated. The text of the original law and the amendments to it include cultural resources and areas of historic importance as part of the environment. CEQA provisions regarding archaeological resources affected by discretionary projects (such as the Exxon project) have been modified by Section 21083.2 of the Public Resource Code, commonly referred to as AB 952. This law, among other things, requires a lead agency to make a two-step determination: 1) whether a project will have a significant effect on archaeological resources and 2) whether such resources are "unique", defined in the statute as:

"an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- 1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information. (Emphasis added.)
- 2) Has a special and particular quality such as oldest of its type or best available example of its type.
- 3) It is directly associated with a scientifically recognized important prehistoric or historic event or person (P.R.C. 21083.2(g))."

The assessment of impacts and the development of mitigations in this document are consistent with CEQA, as amended by Section 21083.2. It should be noted that Mr. Roy Gorman, Chief Counsel of the Coastal Commission, has opined in a recent (3-84) letter to Santa Barbara County (among others) that AB952 did not amend the Coastal Zone Conservation Act of 1976, and that archaeological activities in the Coastal zone, including the development and implementation of mitigation plans, are not affected by AB952 directives. It should also be

noted that AB952 directives do not supercede federal requirements vis-a-vis the effects of the proposed project, a federally permitted action.

The CEQA amendment which addresses most specifically Native Ameerican cultural values and concerns is the 1980 change in Item II, 20 in Appendix I, Environmental Checklist form. Point (b) of this item reads: "Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?" Point (c) reads: "Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?" Both of these points refer specifically to the kinds of concerns addressed in this report, which is compiled in fulfillment of CEQA requirements.

6.2.5.2 Coastal Zone Act and Related Guidelines

The Coastal Zone Conservation Act of 1972, Section 27402, provides that the state should protect coastal resources by avoiding irreversible and irretrievable commitments of coastal zone resources. The Local Coastal Plan and its implementing zoning ordinances include requirements to mitigate impacts to archaeological sites by avoiding impacts or data recovery. Provisions recommending Native American consultation are included in the ordinance.

The Local Coastal Plan was approved by the Santa Barbara County Board of Supervisors in 1980 and partially certified by the State Coastal Commission in 1982. Those areas of concern to Native Americans and set forth in the local coastal plan are within the sections certified by the State Commission. the section on archaeological and historical resources addresses these areas of concern. The State Coastal Act policy pertinent to these resources states:

30244. Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Local policies with regard to archaeological resources include requirements that project designs avoid impacts to such resources where possible. When avoidance is impossible, "mitigations shall be designed in accord with guidelines of the State Office of Historic Preservation and the State of California Native American Heritage Commission" (Santa Barbara County 1982 Coastal Plan, 141; Policies 10-2 and 10-3).

California Senate Concurrent Resolution No. 43, Chapter 87

This act resolves in concurrence with the Assembly, "That all the agencies of the State, with their present staff and facilities are hereby reported to cooperate in current efforts by State and private agencies by reporting all archaeological discoveries of Indian culture in this state to the Division of Beaches and Parks ... and when feasible and consistent with the reasonable exercise of powers of such agencies, to preserve such findings."

6.2.5.3 Native American Heritage Commission

Chapter 1.75, Section 5097.9, of Division 5 of the California Public Resources Code provides for the establishment of a Native American Heritage Commission. This commission is empowered to make recommendations toward the protection and preservation of sacred places on private land and is empowered to bring legal action to protect archaeological sites and sacred places located on public land. The Commission should be included in the design of the project-related compliance program.

6.2.5.4 California Senate Bill 297

The California Senate Bill 297, passed in 1982, addresses the disposition of Native American human burial and skeletal remains. The bill amends various sections of the state's Government Code, Health and Safety Code, and Public Resources Code. The regulations, as amended, stipulate the protection of

burials from disturbance, vandalism, and inadvertent destruction. The statutes empower the Native American Heritage Commission to catalog existing burials and to resolve disputes relating to the treatment and disposition of Native American burials and items associated with them. The regulations also provide for the punishment of vandals, and establish procedures for encouraging private property owners to comply with the recommended treatment of burials. Finally, the codes as amended stipulate specific procedures to be implemented if, during construction of a project, a Native American burial is discovered. All of these statutes and their subsequent stipulated procedures are taken into consideration in the evaluation of impacts and the recommendations of mitigations of this report.

6.2.6 Santa Barbara County Guidelines and Directives

Santa Barbara County guidelines (1980) regarding archaeological project requirements were used, in conjunction with SHPO checklists, to evaluate the quality and adequacy of baseline archaeological data. County cultural resource guidelines (1983) regarding compliance to P.R.C. 21083.2 were followed in discussing site uniqueness and in developing impact assessments and mitigation measures. Finally, the guidelines for protecting and preserving Native American cultural resources, published by the United Chumash Council of Santa Barbara County, are taken into consideration in the procedures described herein.

6.3 AFFECTED ENVIRONMENT

6.3.1 Regional Overview

6.3.1.1 Prehistoric Overview

A regional chronological sequence has been developed by archaeologists to describe societies and cultures which have existed on the Santa Barbara Channel mainland coast (Table 6.3.1-1). Scholars generally concur that Santa Barbara Channel mainland prehistoric societies gradually evolved from the

Table 6.3.1-1. Major Santa Barbara Channel Chronological Frameworks (Chambers, 1982)

YEARS	ROGERS (1929)	WALLACE (1955)	HARRISON (1964, 1966)	KING (N.D.)
AD 1782	Chumash		Historic	AD 1805 Late Period Phase 3 AD 1782
	Canalino	Horizon	Protohistoric 1542	Late Period Phase 2 AD 1500
AD 1000	?	IV AD 1000	Chumash ?	Late Period Phase 1 AD 1100 Middle Period Phase 5 AD 700 Middle Period Phase 5 AD 500
	Hunting People		Hunting People	Middle Period Phase 3 160
Time of Christ			Del Mar Phase	Middle Period Phase 2 530 BC Middle Period Phase 1 1170 BC
1000 BC	?	Horizon III (Intermed.)	Hunting People Extrano Phase	Early Period Phase 2
2000 BC		2200 BC? Horizon	2900 HC Oak Grove, El Capitan	?
3000 BC	Oak Grove			Early Period Phase y
4000 BC			Phase	4000 BC
5000 BC		?	4700 BC Oak Grove Golita Phase	Early Period Phase x ?

simple to the complex. This evolution is reflected in changes in artifact form and diversity, shifts in settlement patterns, and changes in faunal remains recovered from food processing areas.

As is the case with most areas of California, the local chronology is divided into four major phases of prehistory. Although these periods have been given different names by various scholars, they are generally referred to as the Paleo-Indian, Early, Middle, and Late Periods.

The terminal date of Paleo-Indian occupation in the Santa Barbara Channel mainland region is placed at 10,000 years Before Present (B.P.), a date considerably older than the oldest dated Early Period manifestation in the region. The earliest Paleo-Indian occupation in North America has not yet been determined. It is generally accepted that humans entered the New World during the latter part of the Wurm/Wisconsin glaciation, no earlier than 40,000 years B.P., and perhaps as recently as 25,000 - 20,000 years B.P. Few reliable data are available which establish a period of occupation earlier than 30,000 years B.P.

In southern California, such early dates are generally regarded with suspicion due to errors in interpretation of context or because of technical problems with dating procedures.

At the present time, there is no defensible evidence of a Paleo-Indian occupation before 10,000 years B.P. in the Santa Barbara Channel mainland region. The lack of early Paleo-Indian sites may be explained by changes in sea level which have buried coastal landforms that were occupied before this time.

The Early Period of the Santa Barbara Channel mainland region was originally defined by Rogers (1929), who termed it "Oak Grove." His definition of this period was based on the artifacts and physical characteristics of the midden soil. The diagnostic feature of the midden soil was the milling stone. Most reconstructions of the Early Period subsistence patterns stress the dependence

on terrestrial food sources (Wallace, 1955, 1978; Harrison and Harrison, 1966). However, recently dated Early Period components at sites at Diablo Canyon (SLO 2, SLO 585) and Surf (SBa 931) show evidence of substantial maritime collecting in the period ca. 9000 to 7000 years B.P. (Greenwood, 1972). A number of sites situated within the pipeline vicinity date to this time period. In general Early Period sites are found on promontories and terraces near the contact between major canyons and the shoreline. Many Early Period sites are situated about 600 to 1200 feet inland from the present shoreline.

There is a general lack of published data for the Middle Period. Roger (1929) hypothesized a hiatus between the Early and Middle Periods, while other scholars (Landberg, 1965; Harrison and Harrison, 1966; Warren, 1968) have suggested that the Early and Middle period "cultures" may have co-existed for a short time. Depending on the authority, the Middle Period is thought to span the time between 300 B.C. and 1000 A.D.

During the early Middle Period in the Santa Barbara Channel mainland region extensive exploitation of the nearshore fishery becomes evident in midden deposits. Seine net weights, curved fishhooks of bone and shell, and inshore fish bones are common at sites of the early Middle Period. Sea mammal hunting also became important during this period. The Middle Period was a period of economic change reflected in both an expanding trade network which included the Santa Barbara Channel Islands, the Channel coast, and interior valleys, and in larger and more permanent settlements (King, 1981). Several of the sites within and adjacent to the proposed pipeline probably date to this time period.

The Late Period culture is usually termed "Chumash" or "Canalino", and is generally agreed to have begun prior to the time of Christ. All scholars who have postulated chronologies for the region recognize the distinctiveness of the Late Period (Rogers, 1929; Olson, 1930; Wallace, 1955, Harrison and Harrison, 1966; King, n.d.). This period is associated with an efflorescence of material culture, an elaboration of social, economic, and political roles

and organization, an expansion of trade networks, and an aggregation of the coastal population into larger villages. Much of our information about the Chumash was gathered during the latter Protohistoric and Historic periods.

The Chumash of the Santa Barbara Channel region during the protohistoric period (i.e., from Cabrillo's first contact with the natives of the region in 1542 to the beginning of the historic period in 1769) were a marine oriented people, and their greatest technological innovation was an ocean-going vessel made of sewn planks, called a tomol or tomolu (Kroeber, 1925:558; Blackburn, 1975:8, Grant, 1973b:515; Hudson et al., 1978). The tomol was used for fishing, hunting sea mammals, and carrying items for trade between the islands and the mainland.

Other material items used in food acquisition activities included traps, snares, spears, tridents, harpoons, nets, fishhooks and line, and the bow (both self- and sinew-backed) and arrow. Food processing items included mano and metate, mortar and pestle, wooden and stone bowls, baskets, and steatite comales. Decorative and ceremonial items were made of plant materials, shell, bone, wood, stone, hides, and feathers.

The Chumash economic system was complex, involved widespread formalized trading networks, and was closely tied to the kinship, political and religious systems (Blackburn, 1974). Shell bead currency was used throughout southern California, and it appears that the Chumash were the primary makers of this standardized money (Blackburn, 1975:10-11). One early account (1859) described shell money as coming from the "original California mint" at the Santa Barbara Indian rancherias (Woodward, 1934:119).

The political organization of the Chumash was also complex. A chief or captain presided over the primary political unit, the village, assisted by a ceremonial leader and two messengers. Villages were linked together in loose configurations, with chief and members of a principal or capital village having some degree of authority over other villages.

Religious beliefs were also highly developed. Recent research has investigated the knowledge and use of astronomy in Chumash rituals (Hudson and Underhay, 1978), the relationship between Chumash cosmography and mythology (Blackburn, 1975), the role of the dream-helper in Chumash contacts with the supernatural (Applegate, 1978), and the "aquatic motif" in Chumash rock art (Hudson and Conti, 1981).

Kinship and marriage patterns are not as well known as other aspects of Chumash social behavior, but they probably resembled those of the Yokuts of the San Joaquin Valley and the Pomo of northern California (Craig, 1981).

The protohistoric lifeway of the Chumash was interrupted by the arrival of the Spanish expedition led by Gaspar Portola in 1769. The Spaniards were impressed by the Native Americans of the Santa Barbara Channel area and they wrote detailed descriptions of them (e.g., see Costanso, 1970:91ff). The Spaniards clearly regarded the Chumash as an advanced culture in relation to other Native Americans, and anthropologists have tended to agree (Kroeber, 1925:550; Blackburn, 1975:12; Anderson, 1978:10; Hudson and Underhay, 1978:15).

Of all the aboriginal groups encountered by the Spanish during their colonization of coastal California, the Chumash Indians of the Santa Barbara Channel mainland region had the greatest population density and the most highly organized villages. During the protohistoric period (from Cabrillo's voyage in 1542 to the establishment of Spanish colonies in 1769), small island and mainland villages gradually consolidated to form the populous and economically sophisticated mainland society observed by the Spanish in 1769. From the available evidence, it is likely that permanent provisional colonies existed at the mouth of nearly every coastal drainage during the protohistoric and historic periods. Figure 6.3.1-2 illustrates the locations of later Chumash villages based upon current historical and archaeological data; many unrecorded villages undoubtedly exist. The major activities of village life, including residence, food preparation, ceremonial activity, burial of the dead, and tool construction occurred on the various landforms found at the

mouths of these canyons. These villages were the hub of subsistence activities, the locus out of which small work parties emerged to procure local as well as non local resources.

Chumash villages often were occupied continuously for hundreds of years. Many of the village names recorded by Cabrillo's pilot, Ferrel (Pantoja y Arriaga, 1782), were still applied to village locations once Spanish colonization began several hundred years later. Also, there is archaeological evidence of the persistence of occupation at canyon mouth villages. Based on recent and past archaeological excavation programs along the coast, it has been possible to archaeologically verify many of the components of historic villages observed by the Spanish, including cemeteries, residential and other types of structures, and shrine sites.

The Corral/Las Flores canyons contain village sites as well as small sites that resulted from the activities of small work parties and/or other types of small social groups.

6.3.1.2 Historic Overview

The following historic overview of the Santa Barbara Channel mainland region is divided into five time periods that coincide with significant political, economic, and population transitions.

Spanish Period (1782-1822)

Sea expeditions of Cabrillo, Drake, Cavendish, and Cermeno passed through the Santa Barbara Channel between 1542 and 1596. Spanish colonization began with the establishment of the Royal Presidio of Santa Barbara in 1782, Mission Santa Barbara in 1784, and Mission La Purisima in 1787. Mission-related developments occurred in the Santa Ynez Valley and the coastal plain from Santa Barbara to Point Conception. In all, 21 missions, four presidios, and two pueblos were established along the California coast between 1782 and 1823. The

objectives of the missions were to convert the native populations to Catholicism and adapt local populations to Spanish pueblo living by establishing self-sufficient mission communities. the converted populations were economically organized to practice subsistence agriculture and animal husbandry. In addition, industries were established which included metallurgy, weaving, leather working, adobe construction, and various other Hispanic crafts and skills.

Sites and facilities associated with mission lands included the mission quadrangle and adjacent clusters of factories and residence. In more remote parts of mission holdings, agricultural and livestock facilities and outlying chapels were established to serve rural missions' populations. Trail systems connected the missions to each other and to remote facilities, while coastal harbors and landings were active with Spanish, Russian, and English trading vessels.

Rancho Period (1822-1860)

Colonization of Alta California was interrupted by economic and political changes including the collapse of the Spanish Empire, the Mexican Revolution (1822), and the California gold rush (1849). The Spanish settlements in Alta California had begun to deteriorate by 1820 because of diminished financial support from Spain. California administration was transferred to Mexican authorities following the Mexican Revolution of 1822. In 1831, Mexico formally terminated Catholic ownership of the extensive coastal mission properties which were subsequently sold or given away to locally powerful Hispanic or Mexican families. Large private residences with numerous service buildings were built on these former mission lands.

Following the Mexican Revolution, trade restrictions were lifted and foreign settlement was permitted. During the early to mid 19th century, cattle products became virtually the sole economic base of Hispanic California. American, Peruvian, and Russian ships were locally active, trading European and

American products for hides and tallow. Sea otter fur markets also brought American and Hawaiian traders to the area (O'Neil, 1939; Ogden, 1941).

The Rancho Period ended abruptly with the prolonged statewide drought of 1860-1864, which decimated the cattle herds and the hide and tallow industry.

American Period (1860-1900)

The demise of the cattle industry resulted in the partition of the old ranchos and the development of small-scale agriculture. Land along the coastal plains was experimentally planted with a wide range of crops. By 1880, the crops grown in Goleta included beans, corn, barley, peas, beets, potatoes, squash, walnuts, apples, and peaches (Thompson and West, 1897). The Transcontinental Railroad and inexpensive land resulted in a migration of midwestern settlers to the area. To serve the demands of an increasing population, major features of urban development characteristic of this time period were established, including creation of several ports, schools, water systems, roads, colleges, and churches (O'Neil, 1939). The Spanish trail through Gaviota was expanded to accommodate carriages in 1861 (O'Neil, 1939). Soon after, stage lines were running over San Marcos Pass connecting the Santa Barbara area with northern California. In 1887, the coastal railroad was completed connecting Los Angeles with Santa Barbara.

Growth and Development Period (1900-1930)

The coastal railroad network was extended from San Francisco to Point Conception in 1901, connecting the northern and southern parts of the state. The first several decades of the 20th century were characterized by steady population and economic growth. Agriculture was established as the primary coastal economic activity, although oil development began at this time.

Modern Period (1930-present)

Rapid development and population growth have occurred in the Channel mainland region over the past 50 years. This growth has been characterized by the development of specialized agriculture and research industries. The Santa Barbara Channel also became one of the largest oil-producing regions on the West Coast. During this time, many small industries and businesses, and a substantial tourist trade, were established in the Santa Barbara area.

6.3.1.3 Marine Cultural Resource Overview

The cultural history and submarine archaeology of the western Santa Barbara Channel and the point Arguello-Point Conception Bight has been described in the recent Program Environmental Impact Report concerning leasing of state lands between Point Arguello and Point Conception (California State Lands Commission, 1982); the following is excerpted from that document.

Numerous submerged artifacts have been found in the Santa Barbara Channel over the last 50 years. Hudson (1976) has described the known finds through 1975. Since then, additional artifacts have been discovered at Point Conception (Stickel, 1977a; Hudson, 1979) and at Refugio Beach and Mohawk Reef. Additional underwater reconnaissance has been conducted at El Capitan Beach, Refugio Beach, Mohawk Reef, Arroyo Burro Beach, Anacapa Island, Santa Cruz Island, Carpinteria, and Santa Barbara Point (Horne, personal communication). On the reported sites for which sufficient data exist, several have been explained tentatively as submerged offshore villages, and others are considered potential loci of ceremonial deposition or random loss.

Evidence of intact submerged sites is unlikely to be discovered on the seafloor or under recent marine sediments. the expected absence of preservation is a consequence of the erosive power of oceanic forces removing archaeological sites and eroding the landforms on which they were situated as the sea level advanced during recent millenia.

Isolated Chumash artifacts may have come to rest on the seafloor after the sea level advance. These artifacts may have been deposited by cliff erosion of terrestrial sites, loss from fishing canoes, ritual deposition, or random losses. Such artifacts would be almost impossible to find by either remote sensing or underwater survey.

The project area has a lengthy nautical history. Chumash canoes and other aboriginal watercraft were probably first to travel these waters, but because of their fragile construction and perishable materials, it is unlikely that evidence of such vessels would be preserved. Asian vessels may have reached the California coast before the Spanish. Also, accidental contacts by disabled junks may have occurred; undocumented wrecks of such Asian vessels may have occurred in the project area.

Colonial shipping was infrequent and restricted in purpose to passenger travel and supplying the missions, garrisons, and towns of (Spanish) colonial California. Later, during the American period, shipping was one of the engines of progress which created the wood frame core of Santa Barbara and Ventura, and which brought large numbers of European and American settlers. Point Conception and Point Arguello took their toll and many ships were wrecked there, overpowered by the unforgiving weather, seas, and capricious currents prevalent in the project area during this period.

6.3.1.4 The Contemporary Chumash

Today's Santa Barbara Native American community is quite diverse, and is comprised of private individuals as well as several organized entities with Chumash descendants as members. While these organizations and individuals share a certain number of concerns about cultural resources, there are some areas of disagreement regarding cultural resource management. The distinct groups, their history, and their various perspectives are discussed below (adapted from Munoz, 1983).

Land-Based Groups

● Santa Ynez Indian Reservation. The land included within the Santa Ynez Reservation has been occupied by Chumash families from Missions Santa Ynez and La Purisima since at least 1834 (Gardner, 1965). In 1855, 120 acres of land bordering either side of Santa Ynez Creek were set aside, and 109 Chumash families were settled there (Grant, 1978a:507). The number of acres has been reduced through the years, and residents at the reservation talk today of the (re)acquisition of additional land contiguous to the reservation (they have recently gained title to several acres near Ojai). The reservation has played an important role in the preservation of Chumash identity and cultural heritage, and also plays an important role in "modern" (i.e., Western-oriented) health care, education, etc. A representative of the Reservation was interviewed about project concerns.

● Sacred Arrow Society. Dick Pierce and his father have set aside part of the 1,000 acres of their cattle ranch in rural Lompoc for the recently formed Sacred Arrow Society. Two sweat lodges, a vision point, and pow-wow grounds are available to the 270 members of the Society, and to other Native Americans on occasion. Members of the society have widespread ties to other Native Americans in San Luis Obispo, Santa Barbara, and Ventura counties, and share their concerns regarding cultural resource management. A representative of this organization was consulted regarding the proposed project.

Community-Based Associations

Most of the Chumash people were unable to maintain tribally based land holdings. Following secularization of the Franciscan missions in 1834, many Chumash families became private land holders of relatively small ranches and others moved onto ranchos and worked for the Californios (Mexican landowners and ranchers). Few were able to retain title to their holdings, selling to non-Indians or losing title to mortgage holders. Further, some U.S. Indian agents who held land in trust for the Chumash (e.g., Thomas Hope at

Cieneguitas Reservation) succeeded in obtaining title to tribal land. Descendants of these families maintain an ethnic and tribal sense through membership in urban Indian associations, and by kinship and marriage ties to other Chumash in the area.

- Brotherhood of the Tomol. The Brotherhood of the Tomol, an important Chumash association in precontact and early historic times, was reconstituted formally about 1976. The Brotherhood has concentrated on maintaining traditional Chumash lifeways and on passing these cultural traditions on to the younger generation. Until 1983, the Brotherhood was a land-based organization with a rancheria in Gaviota. Unfortunately, the group was not able to gain title to their land, the use of which had been donated. The rancheria still stands, and is currently an ethnographic site potentially within the proposed corridor. Members of the Brotherhood now live in various locations throughout Santa Barbara County, but the organization remains committed to its original goals. These include an activist role in protecting and preserving all cultural resources. Two members of the Brotherhood were consulted regarding their concerns for cultural resources in the proposed project area.

- The Quabajai Chumash Indian Association. The Quabajai Chumash Indian Association, founded in 1971, includes descendants of the Santa Barbara Chumash Reservation at Cieneguitas. By joining together, they are able to preserve more readily their identity and their cultural traditions. Members of the Quabajai Association have been actively engaged in cultural resource planning since 1976, and some of their members are trained and experienced as field archaeologists and as monitors. One member of this association was interviewed concerning the proposed project.

- The Cieneguitas Chumash Indian Association. Thirty-five to 40 of the original 200 or so members of the Quabajai Chumash Indian Association formed the Cieneguitas Chumash Indian Association early in 1980. This is the only all-Chumash urban organization. They are attempting to gain federal

recognition, with help from a local historian and with legal counsel. The Cieneguitas Chumash are concerned with cultural resource management issues, but are currently unable to take an active role in such activities. One member was interviewed for the project.

- The Southern Owl Clan. Families of several of the various Chumash tribal groups recently formalized their association, and are now known as the Southern Owl Clan. The Clan seeks to recreate the traditional lifeways and to live as much as possible as the proto- and prehistoric Chumash did. They do not reside in the Santa Barbara area, but return frequently and as often as their presence is needed. Their primary concern is spiritual matters, and two of them are actively seeking guidance and training from other spiritual leaders. They travel extensively, attending spiritually oriented gatherings, searching for a spot to which they can relocate (this latter in fulfillment, they say, of an ancient Chumash myth). One member of the Clan was interviewed concerning the proposed construction.

- The Santa Barbara Indian Center. The Santa Barbara Center is a nonprofit corporation established in 1975. The purpose of the Center is to "provide a variety of educational, social welfare, public education, and cultural resources management programs for all Indian people in the Santa Barbara area" (Craig, 1980:9). The Center, through its agency, Cultural Resource Associates, was instrumental in the archaeological training of local Native Americans, both Chumash and non-Chumash. Although the Center has been active in cultural resource matters in the past, it is currently in a state of disorganization due to lack of funding and is not able to participate as an organization in the consultation process regarding the proposed pipeline corridor.

- The United Chumash Council. The United Chumash Council was formed in 1982, its membership comprising representatives of all of the groups described above (although the individual representing the Reservation does so in an unofficial capacity), and its stated purpose to deal with cultural resource issues. the

Council has become very active recently, and currently meets weekly. The various groups (with the exception of the Reservation and certain non-affiliated individuals) hope that the Council will become the official body with whom all developers, agencies, etc. will deal regarding projects that may impact cultural resources. The council's view on the proposed project, as well as its recommendations for mitigation procedures, were presented by a number of its members at a council meeting.

6.3.1.5 General Areas of Concern among Santa Barbara's Native Americans

Over the past 15 years, the Santa Barbara Chumash have become increasingly aware of the effects construction may have on cultural resources. During that same period, some portions of the Native American community have become more active in making clear its concerns for these resources, and have developed a level of organization that has made the Chumash successful in having these concerns taken into account in the planning and implementation of construction projects in the area. Although there is a certain amount of diversity of feeling as to which concerns are of highest priority, there is general agreement in the community that these concerns include:

- Native American participation in all phases of cultural resource management;
- Protection of human burials and associated artifacts;
- Protection of plant, animal, and other natural resources;
- Protection of sacred sites; and
- Avoidance of unnecessary impacts to archaeological sites.

It should be noted that Santa Ynez Reservation Indians generally feel less strongly on these issues than other Native Americans.

Participation in All Phases of Cultural Resource Management

Some Chumash maintain that, as the descendants of the first inhabitants of the area, they have a special obligation to watch over the cultural and natural resources of the area. They do not claim to own the land or the sea ("no one can"), but they consider themselves guardians who watch over the land the the sea. Native Americans claim to be the first people to have made use of the petroleum products of the area, and they continue to use the asphaltum for various purposes. They emphasize that Native Americans should be included in cultural resource management from the planning stages of a development project through the final phase of that project. Their involvement should include, they say, at least the following:

- Meeting with representatives of governmental and development firms prior to the beginning of a project;
- Providing planning input that would be considered and acted upon;
- Monitoring during any earth-moving activities; and
- Halting construction activities if they uncover a burial, endanger traditionally important plants, or threaten a sacred spot.

As a rule, some contemporary Chumash feel strongly that the natural environment should not be changed at all. This opposition comes from the traditional role of the Chumash in protecting natural resources. The Chumash realize that others, especially developers, do not agree with this position. The very least developers and government planners can do to minimize impacts on contemporary Native American values, according to the Chumash, is to include representatives of that culture in the management of their own cultural resources during all phases of a development project.

Protection of Human Burials and Associated Artifacts

The basic feeling of Santa Barbara Native Americans is that burials should be completely avoided by any construction project. This feeling arises not only

from reverence for the remains of people considered to be ancestors of contemporary Chumash, but also in some cases the belief that disturbance of the dead will have a harmful effect on the living.

In cases where human burials and associated artifacts are encountered during construction, the universal desire of Native Americans is that the remains and artifacts be re-buried, preferably by a spiritual specialist. Under California State Senate Bill 297, disposition of the remains of Native Americans is under the control of the stipulated next-of-kin. The California Native American Heritage Commission has assigned responsibility for Native American burials in the Santa Barbara area to the United Chumash Council. The Council's regulations require that re-burials be done "without undue delay and as close to the original site without risk of further disturbance." Any re-burials should be conducted by a spiritual specialist to be named by the Council.

It must be stressed that re-burial of human remains is at best an unhappy compromise to be pursued only as a last resort. Any known burials should be strictly avoided during the planning stages of a proposed project, and re-design should be a first option in cases where previously unknown burials are encountered. Under no circumstances should Native American human remains be given to museums or universities for study; this is perceived by all Chumash descendants as a terrible insult to their values.

Protection of Plant, Animal, and Other Natural Resources

Chumash descendants continue to make use of the natural resources of the area, and they are concerned about the potential loss of any of these resources. In traditional religious belief, plants and animals give their lives in donation to Indians for food, medicine, religious purposes, and for manufacturing tools, baskets, and other artifacts. Access to hunting and fishing areas is a sensitive issue among some Chumash. They point out they have raised the issue

repeatedly in negotiations between local Chumash descendants and federal agency representatives regarding cultural resource matters. Contemporary Chumash report frequent use of fish and shellfish; plants for medicinal purposes, food, and basketmaking; and a variety of other natural resources.

Protection of Sacred Sites

All cultural resources are regarded to some degree as sacred by contemporary Native Americans. These resources include gathering sites such as mussel beds; all archaeological sites; ancient tomol building sites and ports; historic village sites; human burials; and sites associated with supernatural power and ceremonial activities.

Avoidance of Unnecessary Impacts to Archaeological Sites

Archaeological sites are sacred to the Chumash. They prefer that sites not be excavated, as described in Munoz (1981:7). However, there is considerable diversity of opinion in the Indian community on this subject. For traditionally oriented groups and individuals, past cultures have been reconstructed in traditional myths and legends, and need not be reconstructed archaeologically.

In addition to religious-based concerns with excavation, Chumash opposition to excavation is usually attributed to one, several, or all of the following concerns:

- Is the research question significant enough to warrant the excavation (read destruction) of the site?
- Is the archaeologist-in-charge sensitive and responsive to Indian concerns regarding burials?
- Is it possible to avoid impacting the area?
- Can the research question be answered through the use of previously collected data and materials?

If excavation is unavoidable, many of the local Native Americans prefer that any artifacts recovered be reburied. At the same time, there is increasing interest among Native Americans to display ancestral artifacts in tribal museums and to understand the long continuity of their ethnic heritage. There is general dissatisfaction with curation of artifacts at a university or other place to which the Chumash do not have ready access.

Chumash who are less traditionally oriented, some of whom live on the Santa Ynez Reservation, are not generally opposed to excavation and other archaeological activities but, like traditionalists, prefer re-burial of human remains encountered.

Additional Concerns

The Brotherhood of the Tomol is particularly concerned with the effects of offshore oil development on marine life, a concern voiced also by other Chumash descendants. The marine life along the mainland coast and Channel Islands traditionally provided readily accessible food for the Chumash, and although the food populations are said to be less plentiful than in former days, the Chumash hope to continue to exploit these resources using traditional sea-lanes to the fisheries and to the Channel Islands. Aesthetic concerns are also important to the Chumash, most particularly the disruption of the beautiful natural landscape/seascape by platforms, tanks, etc.

6.3.2 Local Setting

6.3.2.1 Onshore

The onshore portion of the project has been subject to numerous investigations by professional archaeologists specializing in prehistoric as well as historic cultural resources.

All areas that could be disturbed by the proposed project and its alternatives have been surveyed. All surveys employed transect intervals of 10 m or less, except on slopes greater than 40 degrees which were spot checked. These techniques meet County guidelines for archaeological surveys. Floodplain areas have been subject to extensive sub-surface monitoring and testing programs that a) sufficiently assessed the location, integrity, and the scientific, historic, and ethnic significance of cultural resources in the floodplain and b) resulted in the recommendation of professionally-adequate mitigative measures for future construction in floodplain areas. The adequacy of the monitoring and testing programs as well as the significance evaluations were evaluated with checklists formulated for such purposes by the California State Historic Preservation Office. Evaluations of significance should be reviewed by the State Historic Preservation Office prior to development and implementation of a mitigation plan.

In upper Corral/Las Flores Canyons, grassy areas alongside floodplain areas do not seem to have been surveyed with techniques adequate to locate small sites or sites of low artifact density. County guidelines that vegetation be scraped aside every 15 m in areas of poor ground visibility have not been followed in some areas that would be affected by elements of the proposed alternative. More specifically, the saddle between Corral and Las Flores Canyons and the area immediately east of upper Corral Creek, therefore, may contain archaeological materials that have not yet been recorded.

The earliest archaeological work was conducted by Rodgers (1929) who identified SBa-85, a large prehistoric site on a marine terrace overlooking the mouth of Corral Canyon Creek. Later, foot surveys by Spanne (1973) and Fagan (in Dames and Moore, 1973) covered most of the bottom lands of the Corral/Las Flores Canyon areas, particularly Las Flores Canyon and the pipeline route associated with Exxon's then proposed onshore oil and gas treating facility. These two surveys established the boundaries of SBa-85, documented its disturbance, and recorded SBa-1344, a prehistoric and historic site (SBa-1344) located at the confluence of Las Flores and Corral Creeks. Perez (1975) later

tested SBa-1344 and suggested it was insignificant, a finding that has been uncritically accepted by later investigators (e.g., Dames and Moore, 1982, 1983a).

An archaeological monitoring program was conducted in 1981 by Spanne and local Native Americans in conjunction with grading and site preparation for the POPCO gas treating facility in Las Flores Canyon. The discovery of buried archaeological features along the pipeline route indicated the need for subsurface archaeological testing at the locations of all proposed facilities sites at the mouth of Corral Canyon. These investigations were carried on by the Office of Public Archaeology (OPA), University of California, Santa Barbara. OPA also monitored all POPCO earthmoving activities in undisturbed areas of Corrala/Las Flores Canyons, replacing a similar program by Spanne (1981). During these investigations, OPA conducted a surface and subsurface study of SBa-1733, a prehistoric archaeological site discovered by Spanne (1982) in the floodplain of Corral Canyon Creek, north of U.S. Highway 101. The site was investigated to provide additional data for the interpretation of all archaeological features at the creek mouth. The OPA work, detailed in Neff (1983), demonstrated that SBa-1733 is a scientific and ethnically significant cultural resource, because it has vertical and horizontal integrity, is ethnically significant to local Native Americans, and because the site can yield information important to the study of prehistory.

In 1982, OPA also conducted excavations at a prehistoric village site (SBa-1731) near the beach at the mouth of Corral Canyon. These investigations were conducted to mitigate impacts resulting from the installation of a pipeline associated with the POPCO facility. Results of the investigations, presented in Moore and Luce (1983), demonstrate that, like SBa-1733, SBa-1731 is also scientifically and ethnically significant.

During late 1981 and early 1982, Spanne (1982) surveyed 400 acres in Corral/Las Flores Canyons, including the upper stream courses, proposed pipeline routes along the access road, and at the creek mouth. In 1983 an additional

survey was conducted in upper Corral Canyon by Horne (1983). He reinvestigated a portion of the area examined by Spanne (1982) and surveyed additional area along and adjacent to the drainage. Horne's survey was conducted to investigate areas that might be disturbed by the proposed Las Flores Terminal Project.

OPA's extensive surface and subsurface research programs have produced a clear picture of cultural resources in the floodplain of lower and middle Corral Canyon. Less clear, however, is the cultural resource potential of the upper reaches of Corral and Las Flores canyons. Although some sites were located during previous surveys (Spanne, 1982; Horne, 1983), others may have been overlooked due to heavy grass cover on the slopes and ridges overlooking creek channels.

All onshore cultural resources that have been located in and immediately adjacent to the Corral/Las Flores Canyons area are discussed in Section 5.6.3.1 of the DEIS/R.

6.3.2.2 Offshore

Much of the proposed project area has been subject to SCUBA or geophysical field surveys designed to locate marine cultural resources. In 1975, a SCUBA survey was conducted within the shallow water (0-90 foot depth) field survey corridor for this project (Dames and Moore, 1975).

Geophysical surveys, those utilizing remote-sensing equipment (side-scan sonar, magnetometer, and sub-bottom profiler), have been conducted in deeper waters. In 1981, Fairfield Inc. of Houston conducted a regional survey within the SYU. Also in 1981, portions of the corridor between Hondo A and shore were examined in a limited test geophysical survey by MESA². Soon thereafter, MESA² conducted a shallow water survey (less than 200 feet deep) offshore of the mouth of Corral Canyon. Marine Technical Services (Houston) conducted a deep water survey of the potential pipeline corridors between the Sacate,

Pescado, and Hondo oil fields. Woodward-Clyde Consultants conducted a survey of portions of a corridor between Hondo A and shore (Dames and Moore, 1982b).

Dames and Moore (1982b) has drawn together, analyzed, and presented the results of the above surveys. The remote sensing data are described as of variable quality, ranging from poor to good. The SCUBA survey was deemed adequate.

A reexamination of the remote sensing data has indicated that they are not sufficient to identify all potential cultural resources in the offshore project area. Two major problems exist. First, some areas of potential disturbance have not been surveyed for offshore cultural resources. These include Pescado platform B-1 and about 4500 linear feet of the pipeline corridor between Pescado B-1 and B-2. Second, inadequate control of the remote-sensing "towfish" has resulted in data that are low quality. The magnetometer was towed at too shallow a depth to record all magnetic anomalies (Dames and Moore, 1982b) and the underwater locations of the side-scan sonar instruments were uncertain. These problems have had "a serious affect on the ability of an analyst to make judgements about the signals sensed by the survey instrument." The lack of adequate coverage and high quality locational data are serious deficiencies because the existing data do suggest that potential cultural resources are located within the project area.

6.3.2.3 Native American Concerns

Regional Native American concerns revolve around the desire to be included into planning level input regarding projects in which cultural resources will be impacted. A variety of Native American individuals and organizations along the Santa Barbara Coast are expressing a growing concern and interest in insuring the proper mitigation of such sites.

To collect information on these project-related concerns, two phases of interviews were conducted with Native Americans. The initial (pre-EIS) phase was

conducted by Munoz and reported in Horne (1982). Individuals contacted by Munoz include the following:

- Juanita Centeno (Santa Ynez Indian Reservation)
- Dick and Jeanne Pierce (Sacred Arrow Society)
- Al and Juanita Whitebear, Uncle Irv (Brotherhood of the Tomol)
- Madeline Hall (Quabajai Chumash Indian Association)
- Kote Lotah (Southern Owl Clan)
- Frannie Franco (Cieneguitas Chumash Indian Association)

As part of Phase II (EIS) study, an attempt was made to contact as many of the above people as possible, however, since the Phase I interviews, several people have moved out of the area. Kote Lotah is living in northern California and Al and Juanita Whitebear are now living in Santa Margarita, north of San Luis Obispo. Mr. Whitebear was contacted by telephone and a copy of the Dames and Moore report mailed to him for his comments. Other members of the Brotherhood of the Tomol (Mike Zarate and Sespe) submitted comments in his stead. Individuals contacted during Phase II interviews include the following:

- Juanita Centeno
- Charlie Ochoa
- Madeline Hall
- John Ruiz
- Esther Ruiz
- Dick Pierce
- Jeanne Pierce (representing The United Chumash Council) Mike Zarate Sespe
- Frannie Franco
- Grandfather Victor Lopez
- Winomo (spelling unconfirmed)
- Al Whitebear (responded through Mike Zarate and Sespe)

During these interviews, native American concerns were elicited, including specific responses concerning the three proposed project areas (Exxon Las Flores/Corral Canyons, Getty Gaviota, and Shell Molino) including offshore facilities, and the more general concerns regarding oil and gas development on the Santa Barbara Coast.

6.3.3 Site-Specific Description

6.3.3.1 Las Flores/Corral Canyon

Prehistoric Archaeological Sites

A total of eight archaeological sites have been located and recorded on, or immediately adjacent to, the Exxon Las Flores/Corral Canyon proposed project site. Three sites, and an "isolated find", occur in the vicinity of the confluence of Las Flores and Corral Canyon, in the vicinity of the saddle area and near an extant spring. These sites occur at the periphery of the proposed facility location. Five other archaeological sites cluster within 1/4 mile of each other at the mouth of Corral Canyon, where it enters the ocean at the south end of the Exxon property. These remains, ranging from small isolated artifacts to large prehistoric villages, are briefly described below.

The mouth of Corral Canyon was the focus of much human activity in past times. Five sites and two areas of prehistoric archaeological sensitivity have been identified in this area.

SBa-85 is a large site on a marine terrace overlooking the creek mouth. First discovered by Rodgers (1929), the site seems to be the remains of a large habitation site with associated human burials. The site spans from the Early Period (6000-1000 B.C.) to the Late Period (1100 A.D.-1805 A.D.). Although severely disturbed by erosion and modern construction, it appears that a sufficient, undisturbed deposit remains that could provide data of archaeological value, including burial practices, subsistence, technology, raw

material procurement and trade and culture history. Until further investigations proven otherwise, SBa-85 is considered a potentially significant resource (Horne, 1983) because such sites contain information important to prehistory and are considered ethnically significant because of native American concerns.

SBa-1675, located across the canyon from SBa-85, consists of a lithic artifact/shellfish scatter that may date to the Early Period (Spanne, 1982). Early Period research is a major focus of local archaeological investigations and because it may yield information important to prehistory this small site is considered potentially significant until it is examined further.

SBa-1731 is a buried site located near the beach south of U.S. Highway 101. Limited OPA investigations identified a residential area, denoted by numerous hearths, and a limited activity area utilized for fish-cleaning, game butchering, and the manufacture and modification of lithic tools. Prehistoric occupation primarily dates between A.D. 850 and A.D. 1150, while historic use of the site occurred between A.D. 1770 and A.D. 1850. It is not known whether or not there was an occupational hiatus (Moore and Luce, 1983). Economic data were abundant at the site and indicate the occupants exploited a wide variety of nearby terrestrial and marine environments. Local kelp beds were particularly important suppliers of surf-perch and sardines and the data indicates that late spring and summertime were important periods for fishing activities.

The technology needed to exploit the variety of marine resources include watercraft, dip nets and/or seines, dragnets, gill nets, hook and line, and possibly harpoons (Moore and Luce, 1983). The site has been determined significant because of its chronological association with a little known period of cultural transition, its internal variability and integrity, and its value in analyzing well-recognized research questions on the local and state levels (Moore and Luce, 1983). In addition, as a prehistoric village site, it is of importance to Chumash descendants and other Native Americans.

SBa-1733 is located in the creek floodplain north of U.S. Highway 101. OPA subsurface testing identified the site as being roughly 20 m square. The site's surface has been disturbed but, like SBa-1731, it has yielded important information to prehistory and has the potential to yield further information. The economy of its occupants was similar to that identified at the nearby SBa-1731. The single data indicates occupation around 3300 years ago (Horne, 1983b).

OPA's investigations indicate that two sensitivity zones surround SBa-1733. The zone of secondary sensitivity lies mainly north and east of SBa-1733 and contains similar materials but in much lower concentrations. Burials and other important remains could occur here. The zone of low sensitivity generally encompasses the rest of the floodplain at the creek mouth north of the U.S. Highway 101. No significant remains are expected here but scientifically and ethnically significant buried deposits could occur infrequently (Neff, 1983).

SBa-1732 is a historic archaeological site located in the creek floodplain north of the sensitivity zones described above. Surface materials include 19th and early 20th century glass fragments, a red and white glass bed that could be associated with the Spanish Mission Period (pre-1830), ceramics, sawed deer and livestock bones, shell fragments, cobbles, and other historic debris (Horne, 1983b). Although the surface has been severely disturbed in modern times, subsurface deposits could be present and scientifically significant because it could yield important information about prehistory and history, including data about subsistence, acculturation, technology, trade, culture history, and raw material procurement. SBa-1732 is considered to be a potentially significant resource until further examination is undertaken.

A historic archaeological site may lie beneath a garage located in the floodplain near SBa-1732. Large cobbles that might represent an adobe foundation were found on the garage floor (Costello, 1982). This could be the location of the original home of Jose Dolores Ortega, who was granted "Canada del

Corral" in 1841. If present, the buried site would be potentially significant because it is associated with a historically important person.

SBa-1344 is a dual component (prehistoric and historic) archaeological site located upstream near the confluence of Las Flores and Corral Creeks. Remnants of a late 19th Century structure built by Francisco Orella have been recorded along with prehistoric manos and at least one metate fragment. The historic remains have been moderately disturbed, but intact subsurface deposits including structural remains are possible. This site could provide data on the historic occupation of the area that is unavailable elsewhere. The historic component is thus considered scientifically significant until proven otherwise. Because the site is associated with Orella, an individual of local historical importance, the historic component is also considered historically significant.

The prehistoric component seems to be a thin surface scatter; testing by Perez (1975) indicated a lack of depth. Lack of depth does not mean the site is insignificant (as some would suggest), merely that the site represents a brief occupation. The tools recovered from the site could indicate an Early Period (6000-1000 B.C.) occupation for the collection and processing of certain foods. Knowing the nature, location, and numbers of artifacts on the surface of the site could help answer questions about prehistoric subsistence, technology, and social organization. Early Period sites are poorly understood and their study is a major aspect of scientific research by local and regional archaeologists. Early Period sites that are located relatively far from the ocean, as is SBa-1344, are especially rare. The prehistoric portion of this site has not yet been examined in a manner that would indicate its information potential, and until such an examination, the site's prehistoric component is considered to be potentially significant because it could contain information important to prehistory.

SBa-1734 is a small lithic scatter located on a ridge near the confluence of the Las Flores and Corral Creek. It is probably a surface scatter with

minimal depth and it has not been disturbed. It thus has integrity and could yield information on lithic technology, raw material acquisition, subsistence economics, and the like. Because most regional archaeological research has focused on coastal habitation sites, we know little about activities conducted in small, limited activity sites away from the main residential areas. Small, thin surface sites, thus, represent unique and significant segments of prehistoric settlement and subsistence systems. Until further examination determines otherwise, SBa-1734 is considered to be a potentially significant resource because it can yield information important to prehistory.

Sba-1801 is a small site of fire-cracked rock, bone fragments, and one flake tool located on a ridgetoe overlooking Corral Creek to the west. The site may have some depth and, although partially truncated by a ranch road, has integrity. Archaeological interest in the scientific data within such sites is high because little is known about prehistoric activities outside of residential areas. Since SBa-1801 contains datable materials (bone), it is of special significance, not only because such materials are rare in these types of sites, but because the site can be tied into the chronological sequence established at residential sites near the mouth of Corral Canyon. The site is thus considered significant because it can yield information important to prehistory.

A number of isolated manos and metate slabs, glass and ceramic fragments, and a shell fragment have been located in the central and upper portions of the Las Flores/Corral Canyon area. Once ignored by archaeologists, isolates are now being recognized as potentially significant indicators of patterned human behavior (Thomas, 1975; Doelle, 1976). For example, isolated manos and metate slabs probably indicate the location of prehistoric activities associated with the collection and processing of various types of seeds. As integral aspects of prehistoric cultural systems, "these cultural resources should be accorded a greater profile in archaeological management and not summarily dismissed" (Drover, 1983). Under certain conditions, isolates can yield information important to prehistory, including technology and subsistence.

Historic Structures

Two historic structures near the mouth of Corral Canyon, but north of U.S. Highway 101, may represent structures built in the 1870's by Bruno Orella, a local cattle rancher who bought portions of the lower canyon area from the Ortega's who were hit hard by a statewide drought in the early 1860's (Neff, 1983). One of these structures has been reconstructed and is now occupied. Both are listed on the California Inventory of Historic Resources but have been misidentified as to their original owner and function (Horne, 1983a). Nevertheless, these structures are considered historically significant in their own right.

A wooden cabin is located behind a currently occupied ranch house in upper Corral Canyon. The cabin may date to the 1890s (Neff, 1983). The ranchhouse has not been described or documented to any extent (Horne, 1983). Until these structures are examined by an architectural historian, they are considered significant because they are the oldest standing ranch structures in the area and may contain important architectural information.

6.3.3.2 Shell Molino

The Shell Molino facility is located in Canada de la Huerta, about 3-1/2 miles east of the Getty Gaviota facility. Archaeological reconnaissance of the project area and a proposed pipeline corridor was completed by ESTEC for a draft environmental impact report entitled "Resumption of Exploratory and Development Drilling Operations by the Shell Oil Company" (WESTEC, 1980). The cultural resource investigation itself included a record search at the University of California, Santa Barbara Archaeological Survey, on-foot systematic survey, and report preparation. Based on the results of the archaeological records search and survey no prehistoric sites were observed. However, an interview with a nearby resident, Mr. Loomis, indicated a wooden residence was once located in the extreme northeast corner of the project area. No surface evidence of this site was observed with the exception of a stone wall 15 m

north of the study area. Avoidance of this area was recommended as a mitigation measure by ESTEC, even though the residence has been moved (WESTEC, 1980). Mr. Loomis' current residence was an original adobe built between 1823 and 1850, and lies 20 m west of the proposed project area. While avoidance of the northeast corner of the study area was recommended, no mitigation measures were proposed for the Lomis Adobe because it lay outside the project area. Nor were any mitigations suggested for Sba-1151 which lies 100 m to the west of the project area. The Molino survey itself was conducted utilizing north-south transects at intervals of 4 to 5 m with frequent inspection of subsoil indicators like rodent burrows and drainage banks (WESTEC, 1980). Ground visibility was reported to be excellent due to sparse vegetation. However, subsurface testing could reveal buried archaeological deposits at the canyon mouth and above.

6.3.3.3 Getty Gaviota Site

Archaeological work in the vicinity of the Getty Gaviota facility occurs as early as 1876 by the Rev. Stephen Bowers (1876, 1877). While Bowers recorded and described archaeological sites in diary form (Benson, 1982), formal site recording began with D.B. Rogers in 1929 (University of California, Santa Barbara Site Records SBa-94 and -95). The first project-specific archaeological evaluation of the Getty Gaviota facility was conducted by Wendorf and Greenwood (1980). To date the most recent archaeological evaluation of the subject property are those of WESTEC 1982 (onshore) and Horne 1982 (offshore). At the onset of the WESTEC 1982 investigations, an archaeological records check indicated that three archaeological sites (SBa-94, -95 and -1507) and one historic site (SBa-1555) had been recorded for the project site. Two of these sites (SBa-94 and -95) had been previously visited by Bowers (1876) and recorded by Rogers (1929). Sites SBa-1507 and Sba-1555-H were recorded by Wendorf (1980).

The succession of systematic archaeological investigations on the Getty Gaviota facility from those of Wendorf and Greenwood (1980) to the most recent

of WESTEC (1982) are in general agreement as to the recognition of three archaeological sites and one historical site. All of these sites, with the possible exception of the historical site SBa-1555-H and the lithic manufacturing/maintenance site SBa-1507, seem to have significant spatial and subsurface components.

SBa-94 is located on a ridge between Canada del Cementerio and Canada Alcatraz and consists of a shell midden tested to a depth of 40 cm. (WESTEC, 1982) and characterized as "Oak Grove" in chronological affiliation by Rogers, (1929). The site has been disturbed by asphalt paving and its boundaries remain unknown. The function of the site appears to have been habitation. Intact deposits likely remain and sites like SBa-94 are important because they contain information important to prehistory and are considered ethnically significant by local Native Americans.

SBa-95 is located west of the mouth of Cementerio Creek. The site, tested by WESTEC (1982) had a depth of 40 cm and extended spatially 125 m west of Cementerio Creek. Both SBa-94 and -95 appear to be much larger than their present surface exposures and both appear to be habitation sites.

SBa-1507, located on the northern side of the Getty property was tested WESTEC (1982) and found to be primarily a surface deposit of lithic manufacturing debris. This testing program was not adequate to determine site significance and SBa-1507 is considered potentially significant because it can yield information important to prehistory.

SBa-1555-H located north of U.S. Highway 101 on the west bank of Alcatraz Creek, is a historic deposit of porcelain, earthenware, glass, and mammal bone estimated to be of the Spanish Period. Its significance has not been adequately evaluated but surface materials indicate that it contains information important to prehistory and history. Until it is evaluated, this site is considered scientifically important until it is adequately evaluated.

Sba-1747, located on Cementerio Creek, west of the Getty property on Sunburst Farms property, has been described as a moderately dense shell midden with probable historic and prehistoric components. This site is also in close proximity to the former Brotherhood of the Tomol community. It's significance has not been evaluated but until proven otherwise, it is considered scientifically significant because it may yield information important to prehistory, including data on prehistoric subsistence and settlement patterns.

Both intuitive (Bowers, 1976; Rogers, 1929) and systematic (Wendorf and Greenwood, 1980; WESTEC, 1982) archaeological surveys have been conducted on the Getty Gaviota Facility. A survey conducted on Sunburst Farm by Jon Erlandson (1982) recorded a single site (Sba-1747); however, the survey methodology is unknown. The surveys of the Getty facility and Gervais property conducted by WESTEC (1982) were, however, both intensive and apparently systematic. It appears evident that an intensive/systematic survey comparable to those of WESTEC is lacking for the Sunburst Farms property.

6.4 PROJECT-SPECIFIC IMPACTS

The proposed project and its alternatives may result in direct as well as indirect impacts to cultural resources. Direct impacts are those resulting from land modification directly associated with the layout, construction, and operation of new or improved facilities. These effects eliminate sites and isolated artifacts or reduce their integrity.

Indirect impacts eliminate sites and reduce site integrity by increasing the operation of agents not strictly associated with the planning, construction, and operation of new or improved facilities. These effects primarily result from induced population growth and resultant increases in recreational activities. These effects may be as great as, or greater than direct effects. Common agents of indirect impact include artifact collectors, off-road-vehicle (ORV) users, erosion, project-induced land development, and vandals.

6.4.1 Methodology

The assessment of impacts is limited by 36CFR 800.4 to significant or potentially significant resources. Impact assessment was conducted by a) mapping project elements against known and predicted locations of cultural resources, b) using National Register eligibility criteria to evaluate resource significance, c) using criteria set forth in P.R.C. 21083.2 to evaluate uniqueness, and d) by measuring project effects to the characteristics that make the resource significant and/or unique.

6.4.2 Impacts of the Proposed Project

6.4.2.1 Onshore Impacts of the Proposed Project

Onshore construction would be limited to expansion of the POPCO facility onto an existing pad. therefore, and assuming that the 2 in. gas plant waste water pipeline associated with the proposed action can be placed within areas previously disturbed by existing gas pipeline, no direct impacts to cultural resources are expected to result from construction. Significant class impacts could result if the pipeline were placed in undisturbed areas. Establishment of a 2.0 acre marshalling yard at the mouth of Corral Canyon could either directly affect or avoid cultural resources. This floodplain area has been declared "a zone of archaeological sensitivity" because it contains site SBa-1733, human remains, buried rock features, and other cultural materials. Other potentially significant cultural resources in the floodplain area lie just north of the sensitivity zone and include Sba-1732, two historic structures, and a potential historical archaeological site. The severity of impact depends upon the location, nature, and extent of surface and subsurface disturbances associated with marshalling activities. Although this information is not yet known, two points are worth emphasizing: 1) marshalling activities associated with the Popco gas treating project managed to avoid impacts to cultural remains in this sensitivity zone and 2) direct impacts to such resources are potentially mitigable (Class II).

Exxon is generally committed itself to avoiding direct impacts to cultural resources at the mouth of Corral Canyon through monitoring and, in the specific case of SBa-1733, implementing a testing program to identify site significance, the level of impact, and to develop recommended mitigation measures. Recent archaeological investigations at the mouth of Corral Canyon have resulted in a more refined and appropriate set of mitigation measures for this area than those proposed by Exxon.

Indirect impacts from Off-Road-Vehicles (ORV's), site vandalism, illegal artifact collecting/excavation, and project-induced population growth may affect cultural resources. Exxon has proposed no commitments regarding indirect impacts.

If construction workers are allowed to drive ORV's in the project area, then these sites on the knolls, hills, and ridges overlooking the canyons could easily be destroyed through surface disturbance and increased erosion caused by tire ruts. Sites SBa-1344, 1734, and 1801 are known sites susceptible to ORV impacts. Such impacts to these sites are classified as Class II impacts.

Illegal artifact collection will probably occur only near the mouth of Corral Canyon Creek because surface visibility is too poor in other areas to attract much interest. In contrast, cultural resources are visible on the surface of sites SBa-1732 and 1733 in the Corral Canyon floodplain and may attract the attention of workers involved in marshalling activities. Because artifact collection primarily affects only the surface of sites, there should be no significant impacts of SBa-1732 and Sba-1733 because their surfaces have been heavily disturbed and thus lack integrity. Such impacts can be classified as Class III impacts. No indirect impacts due to illegal collection and excavation are expected to affect the potential historical archaeological site located at the creek mouth because there are no obvious surface remains.

Archaeological sites situated on marine terraces above the mouth of Corral Canyon (i.e., Sba-1675, 85) should be unaffected by construction workers, and other agents of indirect impact because they are located near currently occupied homes. Impacts, should they occur, would be adverse but not significant (Class III).

Vandalism is unlikely to affect historic structures in the project area as long as they are occupied, or are near occupied structures. They may be affected if they are modified to house construction workers or other project personnel. Such modification could reduce the historical and architectural integrity of these resources. These potential impacts are Class II in nature.

Regional population increases can also indirectly affect cultural resources. For example, if the project creates traffic problems, new lands might be disturbed for road construction. A shortage of available housing might require new developments in archaeologically sensitive areas and architecturally or historically significant structures might be raised to make way for new developments. Increased recreational use of the environment can also affect cultural resources. Impacts from these sources are considered below.

There will be no impacts due to project-induced traffic problems. Analysis of the traffic impacts of the proposed project and its alternative indicates that, while significant impacts do occur, major physical changes to existing traffic corridors are not necessary mitigations.

Other than the potential ORV impacts noted earlier, little or no impacts are expected to result from increased recreational use of the environment associated with project related increases in local population levels. Existing recreational facilities are abundant and widespread in both coastal and mountainous areas. They are relatively uncrowded except on certain peak usage days like the Fourth of July. As a result, direct impacts from the

construction of major new recreational complexes will not occur, and indirect impacts will be minimized because most recreational activities will undoubtedly occur at existing facilities.

Housing demand during the peak year will be about 400 units, 350 of which would occur in the Santa Barbara area. This is a significant impact (see Socioeconomics - DEIS/R). Since the area's 1-2 percent housing vacancy rate represents no excess for new housing demand, there will be a demand for new housing developments which could affect archaeological, historical, and/or ethnographic sites. Whether or not this demand is met depends upon whether or not current growth constraints (e.g., Goleta water moratorium, Santa Barbara down-zoning policies) are kept in place. If they are, then most of those seeking Santa Barbara/Goleta housing will be forced elsewhere. The most likely recipients of this housing demand will be Oxnard, Thousand Oaks, and Ventura, in Ventura County, and/or Lompoc in northern Santa Barbara County. Distributing the demand in such a way will probably reduce impacts in any one area to a negligible level (Class III impact).

6.4.2.2 Offshore Impacts of the Proposed Project

Potential impacts on offshore cultural resources could occur during the offshore construction phase. The proposed project disturbance corridor includes three known cultural resource sites. The principal activities that might result in impacts on cultural resources are construction phase mooring system installation, platform installation, pipeline and power cable installation, and anchoring of vessels. The zone of potential disturbance due to the installation of the construction phase mooring system, pipelines, and platforms would have a maximum radius seven times the water depth and would be centered at the mooring system and platform sites (U.S. Department of the Interior, Bureau of Land Management, 1979). Although all impacts will occur within these zones, only parts of each zone will be disturbed by anchoring and construction of the platforms, pipelines, and power cables.

Pipelines and power cables would rest on the seafloor. Deployment of barge anchors during pipeline and power cable placement would involve a maximum construction corridor seven times the water depth (U.S. Department of the Interior, Bureau of Land Management, 1979). This corridor would define the outer boards of the zone of potential disturbance to cultural resources but most of the area within the corridor would not be disturbed.

Literature research and evaluation of the marine geophysical survey records revealed no evidence of features indicative of former environments favorable for aboriginal habitation. Hence, no significant impacts on aboriginal sites are expected to result from construction activities associated with either Option A-1 or Option A-2.

The baseline data are inadequate to accurately predict impacts to shipwrecks and any other deep-water cultural resources that may exist in the project area. Magnetometer data collected from depths greater than 500 feet are poor, and inadequate control of the side-scan sonar "towfish" during the geophysical survey has left uncertain the locations of the four anomalies that were identified as possible marine cultural resources. Given the inadequacy of the baseline data, Exxon's commitments to either avoid offshore cultural resources or institute additional examination of known resources is inadequate to protect resources that may be affected.

If recommended mitigations are implemented, all impacts to offshore cultural resources would be Class II in nature and result in insignificant residual impacts.

6.4.2.3 Native American Concerns

Native Americans are concerned about the protection of sacred sites and human burials, archaeological sites, and certain types of floral, faunal, and mineral resources. The only potential impacts that could result from the

proposed project would be associated with the use of a 2.0 acre portion of the mouth of Corral Canyon as a marshalling yard. Although the location and extent of surface and subsurface disturbance associated with this marshalling area are not yet known, three points can be considered in predicting impacts to Native American values. One, because local Native Americans have voiced little concern about plants, animals, and minerals in the Corral/Las Flores Canyons area, impacts to these types of resources regardless of the extent and amount of disturbance associated with marshalling activities should not concern Native Americans. Two, the marshalling area associated with the POPCO project was able to avoid impacts to cultural resources that were of concern to Native Americans. Three, the POPCO project illustrated that impacts to archaeological sites and even human burials in the project area can be mitigated to a level deemed acceptable by most local Native Americans. If the POPCO project is indicative of future construction projects, then proposed project impacts to resources of concern to Native Americans can be considered potentially mitigable (Class II).

6.4.3 Cumulative Effects

Evaluating the effects of the foreseeable projects will require test excavations at a large number of sites of interest to the scientific community and the public, especially local Native Americans. Mitigating those effects will require full scale excavation of some, if not many, sites. Excavation, even in a limited testing program, is necessarily a destructive process, and information loss is inevitable. The archaeological profession can fully realize its potential contributions to science, the humanities, and to society only if it minimizes the rate of resource loss. Rapid multi-project developments as expected in Santa Barbara and Ventura Counties from oil development can result in enormous information losses due to hasty, inadequate planning and a lack of necessary coordination between all data recovery programs. These include initial, applicant-funded survey and testing programs, as well as post-EIS excavation programs designed to mitigate impacts.

In order to prevent loss of scientific information a single Cultural Resource Compliance Program should be developed and implemented by all cultural research programs (including applicant funded initial studies). This program should a) define the types and content of cultural resource studies and coordination activities required to comply with relevant legislation, b) establish standard sequences for conducting these programs and activities, and c) create standard operating procedures for those teams conducting the programs and activities specified by the Compliance Program. Unless such a program is created soon, the many different research activities associated with the myriad of foreseeable projects will not contribute to an appreciably greater understanding of a rapidly diminishing resource base. These research activities will, in fact, contribute to resource loss instead of mitigate resource loss. More specific comments about such a Compliance Program may be found in Section 6.5. In the paragraphs below, the nature and location of cumulative impacts are briefly described along with mitigating measures.

6.4.3.1 Onshore Cumulative Effects

Most of the foreseeable projects listed in Chapter 4 of the DEIS/R could dramatically impact archaeological sites located near beaches and creek mouths. These areas are the most sensitive archaeologically, because they have the highest density of sites. These canyon mouth sites are often the oldest, largest, and most complex sites. Such sites contain important scientific information concerning prehistoric population size, technology, economy, site structure, trade, cultural adaptations, paleo-environments, and the like. These village sites are especially of concern to local Native Americans, some of whom can document sites where family ancestors once lived. The presence of numerous burials at canyon mouth villages makes these sites extremely sacred to many of the local Chumash Indians. The onshore pipeline associated with Chevron's development of the Point Arguello field could impact over half of all creek mouth locations between Point Conception and Corral/Las Flores Canyons. Of the three alternative marine terminal projects (Getty Gaviota, Aminoil Coal Oil Point, and Las Flores Marine Terminal), the first two could contribute major impacts to prehistoric village complexes.

The above mentioned pipelines could also impact thin, fragile sites located in the foothills and on high ground between major drainages. Small campsites, lithic reduction locations, quarry sites, isolated artifacts and other remains are likely in these areas. They are likely to be relatively undisturbed and, because local research has concentrated at coastal village sites, these small non-residential sites are of scientific interest.

The effects of such impacts will be exacerbated by the current trend of agricultural expansion in the ridgetop/foothill areas west of Goleta. The amount of land disturbed by this expansion is likely to grow from 1.25 square miles to 4.7 square miles of agricultural production. Avocado production is especially damaging and much of the predicted expansion will be for avocado production. Impacts will be accompanied by erosion (see Terrestrial Biology DEIS/R) of sites on cleared slopes.

Population growth induced by oil and gas developments can indirectly affect cultural resources in a myriad of ways. Increased recreational use of the environment can affect archaeological and historical sites but actual impacts are expected to be minimal (Class III) because the current day-use recreational facilities are abundant, relatively uncrowded, and they can accommodate the projected increases in use (see Socioeconomics DEIS/R). Camping facilities may be unable to meet the needs of temporarily employed, in-migrant construction workers. Expansion of facilities could result in direct cultural resource impacts.

The greatest population-related threat to cultural resources is associated with the increased demand for housing and water. Peak year population gains are expected to exceed 31,000 persons and the South Coast will experience a demand for 1,700 additional housing units by 1993 (see Socioeconomics DEIS/R). Needs for water will far exceed supplies. These needs could induce financiers and developers to pressure local decision-makers into reducing current growth management policies (e.g., the Goleta water moratorium, Santa Barbara City low-density zoning, and current plans regarding open space preservation).

Changes in the low-density and open-space policies, as opposed to changes in the water moratorium would result in greater impacts to cultural resources but these could be avoided or otherwise considered during the planning the environmental review process and are thus considered Class II impacts.

Class I impacts would probably result from the reduction or elimination of the Goleta water moratorium because not all resultant impacts would be subject to environmental review. If the moratorium were changed, zoned lands west of Goleta would be prime locations for new housing developments which would probably concentrate on ridges between major drainages and up in the foothills. As mentioned these areas are not only archaeologically sensitive; they are also relatively undisturbed. Impacts in these areas would be exacerbated by a multiplier effect. Much of the easily accessible, relatively flat lands are currently being farmed. As farmland is converted to residential and other uses, new land is put into production and even more sites are potentially disturbed or destroyed. Importantly, under current procedures, only the portion of agricultural land to be rezoned residential would be subject to protection by environmental legislation. Land currently zoned agricultural would require no environmental analysis were it actually put into farm production. Cultural resources in the areas of new farmland would not be protected by the environmental review process. Such a situation would constitute a Class I impact.

The construction of new infrastructural components may be necessary (see Socioeconomics DEIS/R). Cultural resources that could be directly affected but these impacts are considered Class II in nature because they would be considered in the environmental planning and review process.

6.4.3.2 Offshore Cumulative Effects

Offshore effects can only be described generically and briefly because, relative to the onshore project areas, we have little useful data on the nature, location, and information potential of offshore cultural resources. Based upon

current experience, however, it does not seem likely that many resources will be affected offshore because they seem to be relatively scarce and easily avoided. However, like onshore, offshore surveys and subsequent research phases must be guided by a single cultural resource Compliance Program which specifies unified research goals, standard activity sequences, and standard operating procedures. Given the infrequency of impacts, and the potential for avoidance they can be described as Class II in nature if the Cultural Resource Compliance Program is developed.

6.4.3.3 Cumulative Impacts to Native Americans

Cumulative impacts will result in further degradation of the environment and loss of cultural resources, both of which are of great value to Native Americans. However, employment opportunities as a result of cumulative projects may well result in substantial beneficial economic impacts to some Native American groups and individuals.

6.4.4 Project Alternatives

6.4.4.1 Proposed Alternative Project - Onshore Oil Processing

Onshore Impact

Potential direct impacts from the proposed alternative project could result from 1) marshalling yard activities at the mouth of Corral Canyon; 2) construction of the oil treating, power generation, and electrical substation facilities; 3) grading of the saddle between Las Flores and Corral Canyon; 4) the deposition of fill on the east side of the Corral Canyon Creek; 5) land disturbance activities associated with the 50-ft (15-m) wide buffer zone, facility construction zone; and 6) surface and subsurface disturbances in a pipeline construction zone that may be up to 100 ft (15-m) wide. This Option will directly and indirectly damage many more resources than would Option A,

because the proposed alternative requires extensive onshore grading in sensitive areas, requires more onshore construction workers, and induces greater levels of population growth.

Archaeological resources at the mouth of Corral Canyon that could be directly impacted by the currently proposed alternative include significant sites SBa-1731, SBa-1733, zones of secondary and low sensitivity, and an area in the floodplain that may contain a buried, historic archaeological site of cultural significance. These impacts are associated with construction of the pipeline, activities within the 100 ft wide construction corridor, and subsurface disturbances associated with construction of the electrical substation and switch-gear facility. The marshalling yard is unlikely to result in significant impacts unless there is associated subsurface disturbance. All significant impacts are mitigable (Class II) if recommended mitigations are undertaken. As mentioned earlier, Exxon's commitments fall short of adequate protection of known significant resources. There is little likelihood that there will be any impacts along the access road and narrow floodplain in the central portions of Corral Canyon. In contrast, construction in upper Corral and Las Flores Canyons may result in impacts to SBa-1344, SBa-1734, SBa-1801, and several isolated artifacts. It seems likely that there are potentially significant unrecorded sites on the saddle between Las Flores and Corral Canyons and along the east side of Corral Creek. If true (additional field work is necessary to confirm these predictions), they will also be disturbed or destroyed by construction activities. Such impacts would be Class II, assuming that these resources are located and subject to a legally adequate cultural compliance program as recommended at the end of this section. Exxon addressed this survey and are thus inadequate to protect all resources that may be affected. (Note: failure to re-examine the upper reaches of this area will result in a Class I impact rating). The paragraphs that follow elaborate the above summary.

Six additional pipelines would be required to handle the increased production of this alternative and to link project elements. These pipelines will be

placed parallel to an existing gas pipeline trench but the new pipelines will require a 15-25 ft wide trench through previously undisturbed soils. This trench will be from 7 to 10 ft in depth (dimensional data from Exxon's 1982 environmental report, Exhibit D, page 3). This pipeline trench will impact and destroy portions of the western half of Sba-1731, a significant cultural resource located near the beach and underneath the fill of Highway 101. After passing north beneath Highway 101, the pipeline trench will destroy portions of an area described as a zone of secondary archaeological sensitivity. Significant cultural resources may be buried in this area and would be impacted.

Site Sba-1732, a significant resource in the floodplain, and a large portion of the zone of secondary sensitivity, are within the 100 ft wide construction corridor. Impacts to these resources will be Class III in nature as long as no subsurface disturbance occurs. If subsurface disturbance occurs, impacts will be Class II in nature. The same holds true for the 2.0 acre marshalling yard to be located somewhere in this floodplain area.

Additional Class II impacts in the floodplain area may occur due to subsurface disturbances associated with the construction of the electrical substation, the switchgear and any associated components. The area of proposed construction is in an archaeological zone of low sensitivity. The probability of encountering significant remains here is low but possible. Such impacts will only occur if construction entails subsurface disturbance.

Proceeding north, the pipeline trench as presently planned will pass through the location of the original Ortega adobe. Ortega established the first rancho here and it is thought this location contains a buried historic archaeological site of cultural significance. Impacts would be mitigable (Class II) with implementation of recommended mitigation measures.

There is a low probability of archaeological sites occurring along the access road and narrow floodplain in the central portions of Corral Canyon. Archaeological sites have not been found under, or adjacent to, the access road from

site Sba-1732 to the existing gas treating facility. Hence, installation of pipelines and a power cable in the central portion of Corral Canyon is not expected to result in a significant impact on cultural resources.

The expanded gas treating facilities would be constructed on an existing graded pad in Las Flores Canyon. Hence, construction activities for this expansion are not expected to result in significant impacts on cultural resources.

Construction of the oil treating facilities and a cogeneration power plant east of the present POPCO facility would require clearing and grading a 10.0-acre site in the saddle between Las Flores and Corral Canyons. Excess material resulting from grading would be transported to an approximate 8 acre site in Corral Canyon on the east side of Corral Creek. The compacted fill would result in a usable pad that would be available for any future development in the Corral/Las Flores canyons area.

Two sites, SBa-1344 and SBa-1734, and several isolated artifacts have been located in the saddle region, and one site, SBa-1801, has been located along the east side of Corral Creek. It should be emphasized that it is likely that previous archaeological surveys in these upper areas did not identify all resources present. The small knolls, hillocks, and ridgetops in the fill pad area overlooking Corral Canyon Creek are especially likely to contain additional, potentially significant, resources.

Two of the three known sites, SBa-1734 and SBa-1344, are located on the saddle between Corral and Las Flores Canyon. SBa-1734 is substantially above the proposed 10.0 acre site and is unlikely to be directly affected. However, the site could be disturbed or destroyed because the proposed 113 ft high south-facing cut slope at the north end of the site is potentially unstable (Geotechnical Consultants, 1983). Since SBa-1734 is located upslope, any soil slippage or erosion could result in significant site impacts. Such impacts are potentially mitigable and can therefore be classified as Class II in

nature. Since it lacks artifacts that are of interest to collectors, and is usually covered with thick grass, SBa-1734 should not be affected by other agents of indirect impact.

SBa-1344, the third known site, is located south of the proposed 10.0 acre expansion site, and it may be indirectly affected by erosion (Ross, 1984, personal communication). Any heavy equipment or other traffic through the site could also disturb the resource. The prehistoric portion of the site has been subject to Phase I and II archaeological investigations and described as insignificant because it lacked depth and had been partially disturbed. These criteria are not sufficient to determine a lack of significance, the site has been underevaluated, and the prehistoric portion of the site should be considered potentially significant (Snethcamp, 1984, personal communication). This historic portion has not been adequately examined and it could contain the remains of historic structures dating to the late 19th century. These remains are potentially significant and, like the prehistoric portion, could be damaged by traffic and erosion (Ross, 1984, personal communication). All impacts to SBa-1344 are potentially mitigable with standard archaeological procedures and can be classified as Class II impacts.

Two isolated artifacts, a mano and a grinding stone, have been located in the saddle area and seem to be within 100 ft (30-m) of the cut and fill line associated with the 10.0 acre expansion site. These remains are potentially significant and could easily be directly or indirectly affected by cut and fill operations. These impacts are potentially mitigable (Class II).

The only recorded cultural resource that may be affected by filling operations on the east side of Corral Canyon Creek is SBa-1801, a prehistoric camp site that seems to be within the fill area's zone of potential disturbance. This site is potentially significant and it could be disturbed, destroyed, or avoided by project activities. Any impacts could be considered Class II (mitigable) in nature. Unrecorded sites and isolated artifacts probably exist within the fill area's zone of potential disturbance.

It should be noted that several historic structures near the confluence of Las Flores and Corral Canyons are slated for removal. These have not been recorded or assessed for historic or architectural significance and must be considered potentially significant resources. Impact to these structures are potentially mitigable (Class II).

Indirect impacts other than those noted above are similar to those described for the proposed project but will be somewhat greater because the proposed alternative requires more onshore construction workers and will induce higher levels of population growth.

Offshore Impacts

Options B1 and B2 have the potential of affecting four known anomalies that may be significant cultural resources. Options A1 and A2, in contrast, may affect only three known cultural resources. The varying quality of the remote-sensing geophysical survey data suggest that further surveys could locate additional resources in the zones of impact. Impacts to all known resources are potentially mitigable (Class II) if recommended mitigations are adopted.

Native American Concerns

Native Americans have expressed little concern about floral, faunal, and mineral resources in Las Flores and Corral Canyons. Impacts to any of these types of resources should not concern Native Americans.

Native Americans will be concerned about impacts to any of the Native American archaeological sites described as being affected in Section 6.6.6.1 of the DEIS/R, including SBa-1731, 1733, 1344, 1734 and 1801. Native Americans will be concerned about impacts to any areas that have not been adequately surveyed, including the saddle area between Las Flores and Corral Canyons, the

hills and knolls east of Corral Canyon Creek, and the extreme northern portion of Corral Canyon. These concerns are potentially mitigable (Class II).

6.4.4.2 Consolidated/Colocated Facilities

Consolidation or colocation (C/C) is preferred to developing new or improved petroleum processing facilities at independently sited facilities located at separate coastal industrial sites because the C/C option concentrates direct impacts away from coastal sites which usually have greater information potential and are more highly valued by Native Americans than are sites located in the interior.

Impacts due to the C/C option are difficult to compare with those of Option B because the exact locations of C/C facilities have not been proposed and Corral Canyon has not been adequately surveyed by archaeologists. Existing data suggest it is archaeologically sensitive. Because the C/C alternative will impact 12 acres more in the upper Canyon than does Option B, it is likely that more cultural resources could be directly affected by consolidation/colocation. Option B is therefore the preferred alternative.

6.4.4.3 Alternative Siting of Project Components

The Shell Molino site is the preferred alternative site because no cultural resources sites will be directly affected. Aside from Shell Molino, the Corral Canyon siting alternative is preferred over the Getty Gaviota facility because the latter will result in impacts to resources that have greater information potential and greater Native American cultural significance than those resources that would be affected at Corral Canyon (however, this is a probabilistic statement because portions of upper Corral Canyon have not been adequately surveyed). At this point, there is not sufficient information to accurately distinguish impacts of the Corral Canyon site from the proposed

site under Option B. Both areas have been inadequately surveyed and the acreage of the Corral Canyon site has not been determined.

6.4.4.4 Phased Oil and Gas Production

Direct impacts to cultural resources would be reduced by downsizing facilities and reducing production only if downsizing resulted in significantly less land modification. Indirect impacts may be much lower, perhaps by as much as one-third, because reducing development would reduce the magnitude of population impacts and extend project-related growth over a longer period of time. Differences in levels of impact reduction between phasing oil production versus phasing gas production depend directly on the magnitude of differences in reduced growth. These data are not currently available.

6.4.4.5 Pipeline Transportation of Crude Oil

Any long distance pipeline such as the Getty route to Bakersfield, the coastal route to El Segundo, much less an extended pipeline from southern California to the Gulf of Mexico, is bound to impact numerous cultural resource sites even if the construction takes place in existing right-of-ways (ROWs). Pipeline corridors tend to follow routes with the least gradient, through drainages and canyon bottoms; these areas are also very likely to have had prehistoric occupation.

By comparison, the transportation of oil via tanker and marine terminal construction to other west coast refining facilities or to the Gulf coast would probably have far fewer impacts to cultural resources.

Aside from possible direct and indirect impacts occurring to cultural resources from construction and/or maintenance of pipeline/tanker facilities, possible oil spills and cleanup activities pose another threat. Impacts resulting from oil spills would, in the case of cultural resources, probably be greater from onshore pipeline transportation of crude oil than from tanker transportation.

The physical proximity of the pipeline to onshore archaeological sites and the nature of onshore cleanup activities would result in a greater threat to cultural resource sites from the pipeline alternative. Oil spills could also introduce fossil carbons into archaeological sites, thus introducing error into chemical dating techniques such as Carbon 14.

6.4.4.6 Pier Tanker Mooring

A comparison of potential impacts deriving from the construction of pier tanker mooring facilities with a single anchor leg mooring (SALM) greatly favors the SALM. Much greater bottom disturbances would result to shallow water landforms from the construction of pier facilities than from the single submerged anchor leg of the SALM. Somewhat greater onshore disturbance expected with pier construction could result in much greater impacts onshore, however, with proper siting, this impact could be mitigated and possibly eliminated.

6.4.4.7 Electric Power from Utility Grid

The utility grid will result in fewer impacts than the cogeneration facility under Option B because the latter requires conduit to the platforms. Both this alternative and Option B will require a new substation at the mouth of Corral Canyon. Option B would additionally require placing new conductors on existing power poles or placing taller poles in existing pole locations. Neither of these additional activities will affect cultural resources. The only difference between Option B and the utility grid option is that Option B will require a conduit corridor to the platforms and the utility grid option will not (power will be produced by gas-fired turbines on each platform). If this conduit cannot be placed in the same trench as the Option B pipelines, then this conduit will result in significant onshore impacts to resources at the mouth of Corral Canyon including zones of low and secondary sensitivity, SBa-1733, and SBa-1731. Offshore impacts of the Option B conduit could occur if laybarge anchor drag is not controlled (direct impacts in the pipeline/

conduit corridor have been avoided by an Exxon proposed mitigation to establish a 300 ft construction standoff zone around each potential cultural resource).

6.4.4.8 Subsea Production Facilities

This alternative is compared with the current proposal to utilize surface platforms. Subsea production differs from conventional surface production in that the former can involve drilling at several subsea locations other than directly below the platform locations. Each individual well or well cluster would require use of a large floating drillship and a large laybarge to lay pipelines to the central surface platform. Anchoring disturbance will be much greater than that associated with construction of surface production facilities. The subsea production option thus disturbs more total seafloor area than surface production and could result in greater impacts to potential cultural resources. Such impacts are Class II in nature.

6.4.4.9 Reinjection of Produced Water

In the area of cultural resources, if a substantial number of onshore reinjection wells and connecting pipelines would be necessary to implement this alternative, then reinjection would not be less disruptive than ocean disposal. With many wells, it is likely that the extent of reinjection-related disturbance would be greater than that associated with an ocean outfall, and would occur in archaeologically sensitive areas. The outfall pipeline, however, could also impact significant archaeological sites at beach and canyon mouth areas. However, all impacts could be eliminated with recommended mitigation measures and can be classified as Class II in nature.

6.4.4.10 No Project Alternative

Impacts of the no project alternative would be slightly less than those associated with the proposed project and much less than those associated with the proposed alternative (Option B).

6.5 MITIGATION MEASURES

Tables 6.5-1 and 6.5-2 present a summary of mitigation measures compiled to address the previously described impacts of the proposed project and the proposed alternative projects. Impact categories and summaries of mitigation effectiveness are also provided.

The recommended mitigation measures should form the basis of an Exxon commitment to adhere to a legally adequate cultural resource compliance program that would be developed later (before ground disturbance activities), by the County of Santa Barbara, State Lands Commission, the Native American Heritage Commission, and MMS in consultation with the California State Historic Offices and the Advisory council on Historic Preservation. This program should be prepared to guide all energy-related cultural resource investigations along the South Coast, the Exxon project being merely one. In order to maximize benefits to science, the humanities, and to society, it is essential that all cultural resource investigations, including applicant-funded initial studies, be subject to common goals, techniques and methods. This program should a) define the types and content of cultural resource studies and coordination activities required to comply with relevant legislation, b) establish standard sequences for conducting these programs and activities, and c) create standard operating procedures for those teams conducting the specified programs and activities. If it is not feasible to prepare such a broadly applicable program prior to initiation of Exxon related mitigations, a legally adequate, project-specific compliance program should be prepared that is capable of serving as a nucleus for further development and expansion. As a federally permitted project, mitigation expenditures up to 1 percent of total project costs are available as per the Archaeological Historic Preservation Act of 1974. Exxon's commitment to a cultural resource program could be detailed in a formal agreement between Exxon and the permitting agencies. Project-specific concerns that should be detailed in the agreement include:

Table 6.5--1. Mitigation Measures Summary of the Proposed Project

IMPACT CATEGORY	POTENTIAL IMPACT	MITIGATION MEASURE	EFFECTIVENESS OF MITIGATION MEASURE
I	Major reduction in numbers of cultural resources due to disturbance associated with cumulative development. Lack of common compliance program to guide investigators results in significant data loss. Local curation facilities cannot accommodate all archaeological materials recovered.	Prepare a single Cultural Resource Compliance Program to guide all energy-related cultural resource surveys, testing, and mitigation programs for Native American concerns, archaeological, historical, and architectural resources. Expand curation facility if necessary.	Significant, however, when implemented does result in meaningful data loss reduction.
II	Potential ORV and construction traffic impacts to SBa 1344, 1734, 1801, and isolated artifacts.	Prohibit ORV access and avoid construction traffic impacts. If impossible, conduct excavations to determine significance. If significant, excavate 1m ² test units at each site and preserve via capping or conduct further mitigations.	Insignificant
II	Historic structures may be destroyed or modified.	Document structures and evaluate significance. If significant, preserve or allow only compatible modifications.	Insignificant
II	Direct impact to zone of secondary sensitivity at mouth of Corral Canyon from marshalling and/or pipeline trenching activities.	Avoid if possible. If not, conduct subsurface testing. If dense/intact deposits encountered, conduct appropriate mitigation program.	Insignificant
II	Direct impact to zone of low sensitivity at mouth of Corral Canyon from marshalling and/or pipeline trenching activities.	Monitor construction. If dense/intact deposits encountered avoid or halt/redirect construction until mitigation measures implemented.	Insignificant
II	Direct impacts to SBa-1732 and Ortega adobe from marshalling or pipelaying activities.	Avoidance if possible. If not, test excavate to determine significance. If significant, excavate 1m ² test units and preserve via capping or implement mitigation excavations.	Insignificant
II	Disturbance of unidentified offshore cultural resources (direct impacts to shipwrecks from platform placement, drilling, anchoring, pipelines).	Conduct additional geophysical survey to accurately identify and locate potential resources. Impose 300 foot enforceable radius of avoidance around each. If impossible, identify resource significance and implement appropriate mitigation.	Insignificant
II	Direct impacts to sites due to cumulative development induced policy changes fostering widespread, rapid growth.	Maintain growth control policies	Insignificant

Table 6.5-2. Mitigation Measures Summary of the Proposed Alternative Project

IMPACT CATEGORY	POTENTIAL IMPACT	MITIGATION MEASURE	RESIDUAL IMPACT
I	Major reduction in numbers of cultural resources due to disturbances associated with cumulative development. Lack of common compliance program to guide investigations results in significant data loss. Local curation facilities cannot accommodate all archaeological materials recovered.	Prepare a single Cultural Resource Compliance Program to guide all energy related cultural resource surveys testing and mitigation programs for native American concerns, archaeological, physical, and architectural resources. Expand curation space if possible.	Significant, however when implemented does result in meaningful data loss reduction.
II	Potential ORV and construction traffic impacts to SBa, 1344, 1734, 1801, and isolated artifacts.	Prohibit ORV access and avoid construction traffic. If impossible conduct test excavations to determine significance. If significant, excavate several 1/m ² test units at each site and preserve via capping or conduct further mitigations.	Insignificant
II	Historic structures may be destroyed or modified.	Document structures and evaluate significance. If significant, preserve or allow only compatible modifications.	Insignificant
II	Direct impacts to SBa 1731, 1733 from marshalling and/or pipeline trenching activities.	Avoidance if possible. If not, excavate several 1 m ² test units in each site and preserve via capping or institute mitigation excavations.	Insignificant
II	Direct impacts to zone of secondary sensitivity at mouth of Corral Canyon from marshalling and/or pipeline trenching activities.	Avoidance, if possible. If not conduct subsurface testing. If dense/intact deposits encountered conduct appropriate mitigation program.	Insignificant
II	Direct impact to zone of low sensitivity at mouth of Corral Canyon from marshalling and/or pipelines trenching activities.	Monitor construction. If dense/intact deposits encountered, avoid or halt construction until mitigation measures implemented.	Insignificant
II	Impacts to Ortega adobe (potential buried historic archaeological site), SBa-1732, SBa 1801 from marshalling, trenching, and/or grading activities.	Avoidance if possible. If not define and evaluate resource with subsurface testing. If significant, test and excavate 1 m ² test units and preserve via capping or implement mitigation excavations.	Insignificant
II	Cut slope instability impacts SBa 1734.	Avoidance through redesign; test/excavate to define significance. If significant implement mitigation measures.	Insignificant
II	Disturbance of unidentified offshore cultural resources (direct impacts to shipwrecks from drilling, anchoring).	Conduct additional geophysical survey to identify and accurately locate potential resources. Impose enforceable 300 foot radius of avoidance around each. If impossible, identify resource significance and implement mitigation measures.	Insignificant

Table 6.5-2. Continued

IMPACT CATEGORY	POTENTIAL IMPACT	MITIGATION MEASURE	RESIDUAL IMPACT
II	Direct impacts to sites due to cumulative development induced policy changes fostering widespread, rapid growth.	Maintenance of growth control policies.	Insignificant
II	Potential disturbance of unrecorded historic and archaeological resources in the saddle area between Corral and Las Flores Canyons, and in Corral Canyon south of Vequeros formation.	Document and determine significance of historical structures in Upper Corral Canyon. If significant, avoid or preserve selectively. Clear ground cover, conduct cultural resource survey. Conduct subsurface testing to evaluate significance of archaeological resources. If significant, avoid; if avoidance impossible, excavate several 1 m ² test units in each and preserve via capping or institute mitigation excavations.	Insignificant

- Completion of cultural resource inventories that are adequate to identify all surface-evident archaeological and architectural/engineering resources that would be significantly affected by the proposed actions
- Completion of evaluations of resource significance, based upon criteria specified by ethnic concerns and a problem-oriented research design that is regional in scope and concern
- For all significant resources that cannot be avoided, development of measures to protect an adequate amount of the values that make the resource significant--protection under a covering pad, recovery through scientific excavation and analysis, relocation of a structure, detailed architectural/engineering description
- Implementation of the mitigation program
- Monitoring of some project areas that (based on geomorphology, soils, comparable archaeological data) have a reasonable probability of containing significant resources that are not presently evident on the surface
- Development of a program to manage emergency discoveries, e.g., the discovery of previously unidentified (and often unidentifiable) significant cultural resources during project construction
- Mechanisms for disseminating project information results to agencies, the lay public, and the profession.

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